The value of cooperation

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Studies on the Performance Outcomes of Interorganizational Alliances

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Proefschrift

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To João

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CONTENTS

CHAPTER ONE

INTRODUCTION

> *From the moment we are introduced to science we are told it is a cooperative, cumulative enterprise. Like the artisans who construct a building from blueprints, bricks, and mortar, scientists contribute to a common edifice called knowledge. Theorists provide the blueprints and researchers collect the data that are the bricks.*
>
> *To extent the analogy further, we might say that research synthesists are the bricklayers and the hodcarriers of the science guild. It is their job to stack the bricks according to plan and apply the mortar that holds the structure together*
>
> Cooper and Hedges, *The Handbook of Research Synthesis*

THE ASSETS, resources, knowledge, and capabilities that provide the basis for firm performance, survival and expansion do not often fully reside inside single firms. Instead, many of these factors are broadly distributed across a wide range of firms and institutions that span industry and geographical boundaries. For instance, when expanding abroad firms do not always have all the internal knowledge required to enter and operate successfully in a foreign market (e.g., Hennart, 1988). This knowledge is, instead, generally possessed by local firms which are familiar with the host country's cultural norms and institutions. Similarly, in rapidly evolving industries technological knowledge and innovation are typically dispersed among competing firms, suppliers, universities, research laboratories, and customers (e.g., Powell, Koput, and Smith-Doerr, 1996).

In recent decades, the dispersion of resources and capabilities among economic actors has led to an increase in the formation of strategic alliances as a primary mechanism for

exploiting interdependencies between organizations (e.g., Hennart, 1988; Gulati and Gargiulo, 1999). Strategic alliances are voluntary contractual agreements to govern the interorganizational coordination, sharing, exchange, or combination of assets, knowledge, capabilities, or activities. Alliances between organizations can take different forms, such as joint ventures, research and development agreements, or co-marketing partnerships, and may serve a variety of purposes, including international expansion, increasing market power, sharing risks, or obtaining economies of scale or scope (e.g., Hagedoorn, 1993; Hennart, 1988).

The volume of research on alliances in organization and strategy has paralleled their growth as modes of corporate development. Indeed, a large number of studies have been conducted investigating the antecedents of alliance formation, the choice of governance structure, the post-formation collaborative dynamics between the partners, and the performance outcomes of alliances (Gulati, 1998). A key premise underlying all these studies is the notion that alliances are formed to achieve economic gains and create value for the participating firms (Stuart, 2000). The research literature has investigated the performance outcomes of strategic alliances at two distinct levels of analysis (Gulati, 1998): (a) the performance of alliances themselves, where the alliance is the level of analysis, and (b) the performance effects of alliances for firms entering them, where the firm is the level of analysis.

These two levels of analysis are associated with distinct streams of research that differ in several important ways. First, these two streams of research have investigated different dependent variables, emphasized different explanatory variables, and adopted different methodological approaches. Specifically, while research on the determinants of *alliance performance* has primarily emphasized the role of governance structure and interorganizational processes as key determinants, has been mainly based on survey methods,

and has used managers' evaluations of alliance performance as the focal dependent variables, research on the *link between alliance formation and firm value* has emphasized the type of interdependency exploited in the cooperative venture and the collaborative conditions present at the inception of the alliance as key determinants, has been based on the event study method, and has adopted abnormal returns associated with alliance announcements as the focal dependent variable.

Second, research also suggests that there is not always a one-to-one correspondence between alliance performance and the effect of strategic alliances on firm value (e.g., Gulati and Wang, 2003; Khanna, Gulati, and Nohria, 1998). For example, research by Gulati and Wang (2003) has shown that although alliances may create value, relative value appropriation may differ between the partnering firms and alliance partners may not always extract commensurately equal value from the alliance. The results reported in Chapter 5 are also consistent with the notion that partners may benefit differentially from interorganizational cooperation. In particular, our results suggest, for instance, that partners that are active in a product-market domain that is moderately similar to that of the alliance is able to create more firm value than a partner that is active in a product-market domain unrelated to that of the alliance. Similarly, the link between alliance performance and its impact on firm value may also depend on the fit between the goal of the alliance and the firm's strategy. For instance, an alliance may be successful but may not fit with the overall strategic direction of one or several of its parents. As a result, it may be discounted by investors. Conversely, a loss-making alliance may result in a large increase in firm value because it is being milked by the parents through transfer pricing or because it is perceived by the market as having an important option value in terms of access to new markets or technologies.

While individual studies have led to valuable insights on the performance outcomes of alliances and their determinants, the cumulative empirical evidence remains seemingly

inconclusive at both levels of analysis. At the *alliance level*, there is limited consensus on the factors that influence alliance performance. At the *firm level*, extant research has produced contradictory findings on whether, on average, firms benefit from entering alliances, and why some alliances create more value for the partnering firms than others. Thus, despite the pervasiveness of strategic alliances and extensive academic research on the performance outcomes of alliances important questions remain.

In this dissertation, I use meta-analysis to clarify and integrate prior empirical research on the performance outcomes of strategic alliances. The purpose is to identify the consistencies that emerge from prior research and account for the variability in findings across studies and, in doing so, establish firm empirical generalizations on (a) the factors that influence the performance of alliances, and on (b) the average effect of strategic alliances on firm value, and the factors that determine it. In addition, I explore in this dissertation the boundaries and modifiers of these generalizations.

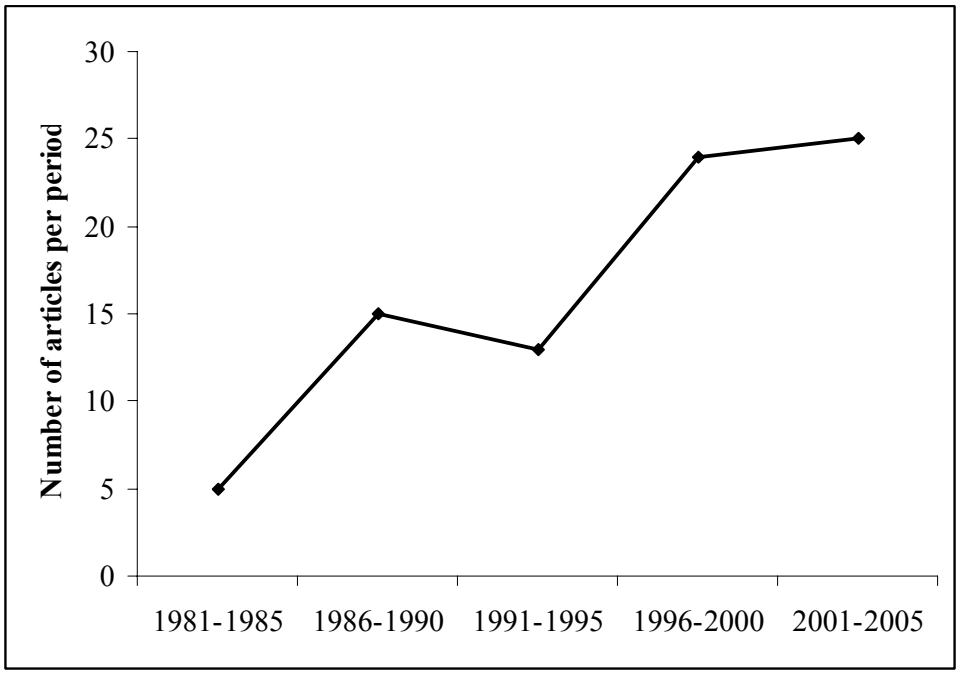
Meta-analysis is a set of statistical procedures for quantitatively cumulating and synthesizing evidence from a large number of studies in a research literature. Meta-analysis provides a valuable method for integrating and interpreting research literatures, particularly when they contain contradictory findings (Cooper and Hedges, 1994). In meta-analysis, study findings are transformed to a common metric, which in management research is typically a correlation coefficient. Meta-analysis involves using statistical methods to estimate with precision the average level of an effect and to identify potential sources of variation in study findings.

In the fields of organization and strategy, meta-analysis has been increasingly applied to establish empirical generalizations across a variety of research literatures (see Figure 1.1). Some examples include the link between diversification and firm performance (Palich, Cardinal, and Miller, 2000), the determinants of the impact of mergers and acquisitions on

firm value (King, Dalton, Daily, and Govin, 2004), and the relationship between the size of the board of directors and firm performance (Dalton, Daily, Johnson, and Ellstrand, 1999).

FIGURE 1.1

20-Year Growth of the Meta-Analytic Literature in Organization and Strategy



A LOOK AHEAD

The event study method has been the prevalent methodology to estimate the effects of individual strategic alliances on firm value (Gulati, 1998). In Chapter 2 we examine whether the magnitude of estimated stock market reactions to corporate events is sensitive to the event study methodology used. Results from a meta-analysis of 110 studies examining stock market reactions to 32,596 strategic alliance announcements show that estimated abnormal returns are influenced by the length of the event window. However, we also find that event study findings are remarkably robust to variations in the specification of the return-generating process, in the accommodation of possible confounding events, in the length and type of estimation window, and in the composition and time frame of the sample.

Chapter 3 examines the link between alliance formation and firm value. Despite the large number of studies conducted to date, whether and under what conditions firms derive economic benefits from strategic alliances has not yet been firmly established. Chapter 3 synthesizes two decades of empirical research to provide a systematic, quantitative analysis of the impact of strategic alliance formation on firm value. Our meta-analysis of 110 studies examining 32,596 strategic alliances formed between 1963 and 2001 leads to the strong conclusion that, on average, alliances create value for the partnering firms. Furthermore, our meta-analysis of 78 articles (83 independent samples; N = 15,439) investigating the effects of 14 distinct factors that determine the impact of strategic alliances on firm value suggests that the type of resources exploited in the alliance, the collaborative conditions under which interorganizational cooperation takes place, and the experience of the partnering firms are key antecedents of value creation. We discuss the implications of these findings and offer directions for future research.

The study of the determinants of alliance performance has been one of the most popular topics in the literature on strategic alliances. However, prior research has emphasized

the development and testing of new theory rather than the establishment of empirical generalizations and has produced inconsistent findings with respect to the relative contribution, magnitude, statistical significance, and direction of the determinants of alliance performance. Thus, despite extensive research no clear consensus exists regarding the antecedents of alliance performance. The research reported in Chapter 4 cumulates 78 empirical studies and establish a quantitative synthesis of the influence of initial conditions, governance structure and post-formation dynamics on alliance performance. While Chapter 3 focuses on the link between alliance formation and firm value, Chapter 4 investigates the performance of alliances themselves. By cumulating empirical evidence across a wide range of empirical studies we are able to establish firm empirical generalizations on the determinants of strategic alliance performance. Among other results, we find that three categories of variables (1) *initial conditions,* such as the extent to which the alliance pools complementary assets, knowledge, and activities, (2) *governance structure*, such as the level of interorganizational trust, and (3) *post-formation dynamics* between the alliance partners, such as information exchange and cooperative behavior, account for a significant proportion of the variation in alliance performance, with each of these three categories of variables accounting for approximately one third of the explained variation. In addition, of the nine antecedents of alliance performance investigated, the existence of prior ties, the level of trust, of information exchange, and of cooperative behavior between the alliance partners had, together with alliance age, the strongest direct effects on alliance performance.

The final chapter of this dissertation, Chapter 5, summarizes the key findings and speculates on potential directions for future research.

CHAPTER TWO[1]

DOES THE CHOICE OF EVENT STUDY METHODOLOGY IMPACT ESTIMATED ABNORMAL RETURNS? A META-ANALYTICAL INQUIRY

EVENT STUDIES have become a predominant research methodology to investigate the impact of economic events on firm value. They have been applied in finance, accounting, management, economics, marketing, and law to estimate the financial effects of endogenous corporate events, such as earnings announcements, and of exogenous industry, regulatory and macroeconomic events (MacKinlay, 1997).

To test the financial impact of events, extant empirical research has primarily employed the event study methodology introduced by Ball and Brown (1968) and Fama, Fisher, Jensen, and Roll (1969). In this approach, the financial effects associated with the release of unanticipated information, termed abnormal returns, are measured as the difference between the observed event-day returns on a security and the estimated returns that would be expected in the absence of the event.

Since these initial applications, a number of modifications and extensions of the event study methodology have been proposed (MacKinlay, 1997). These developments include

[1] This chapter is the result of joint work with Tammo H.A. Bijmolt and Jean-François Hennart. We thank Rezaul Kabir, Marcel Pronk, Luc Renneboog and Bas Werker for helpful comments and suggestions. The list of studies included in this meta-analysis is provided in Appendix A.

methods that accommodate departures from the statistical assumptions underlying early event studies, and methods that extend this methodology to specific settings[2]. These modifications to the classic event study design have been paralleled by considerable diversity in the methodologies that researchers have used to measure and test abnormal returns in empirical applications. In particular, empirical research employing the event study method varies not only in the extent to which the extensions to the original methodology have been implemented, but also in the type of model specification used to estimate expected returns, in the type and length of the estimation window, in the length of the event window, and in the decision of whether or not to control for confounding announcements (Peterson, 1989; MacKinlay, 1997). The multiplicity of event study methodologies that have been developed and the heterogeneity in how the method has been applied in empirical studies raise an important question: Does the choice of methodology influence event study findings? In other words, is the magnitude of estimated abnormal returns sensitive to variations in the event study methods used? This question is particularly important in light of research showing that event studies have produced inconsistent empirical findings regarding the impact on firm value of different types of corporate announcements such as mergers and acquisitions (King, Dalton, Daily, and Covin, 2004), and strategic alliances (e.g., Gulati, 1998), among others. In this paper we address this question by conducting a meta-analysis of 110 event studies examining the effects of strategic alliance announcements on firm value. While most previous studies have used *simulation* to investigate the *power* of event studies, we use *meta-analysis* to examine how the *magnitude* of the impact of alliances on firm value may have been influenced by choices in research methodology and sample composition (Hunter and

[2] For instance, methods have been devised to adjust for nonsynchronous trading in securities (Scholes and Williams (1977), Dimson (1979), and for clustering in event dates (Schipper and Thompson (1983), Collins and Dent (1984), to incorporate uncertainty in the event date (Ball and Tourous (1988), to account for event-induced variance in security returns (Boehmer, Musumeci, and Poulsen (1991), to test for abnormal security performance more accurately (Corrado (1989) and to conduct event studies in multi-country settings (Park 2004).

Schmidt, 1990; Miller and Pollock, 1994).

The study of the impact of methodological decisions on event study outcomes has important implications for the interpretation of past empirical evidence and for the design of event studies. First, it could be that contradictory findings on the impact of different types of economic events on firm value may, in part, be due to the use of different event study methods. Indeed, this is what Halpern (1983) suggested in his review of event studies on mergers and acquisitions. Because inconsistent findings are common in studies on various types of corporate events it is important to investigate the extent to which these divergences are due to the use of different event study methodologies. Second, when designing event studies to assess the effects of economic events on firm value, it is crucial to measure the magnitude of these effects accurately. For this reason it is important to understand whether and how different methodological choices influence estimated abnormal returns.

Prior research has investigated how (a) distinct event conditions, such as the magnitude of abnormal returns, the level of uncertainty about the event date, or the degree of clustering in event dates, and (b) methodological choices concerning the specification of the return-generating model and test statistics, influence the power of event studies, that is, their ability to detect non-zero abnormal performance (e.g., Brown and Warner, 1980, 1985; Dyckman, Philbrik and Stephan, 1984). An overview of these prior studies is provided in Table 2.1. The present paper extends this line of research in three directions. First, while extant research has looked at how event conditions and methodological choices influence the *statistical power* of event studies, we consider whether and how they may influence the *magnitude* of estimated abnormal returns. This is a critical distinction because the purpose of event studies is not only to test for the *significance* of stock market reactions to economic events, but also to estimate the *strength* of such reactions. Second, we expand the scope of prior research by investigating the joint effects of a more comprehensive range of

methodological choices: (a) the decision of whether or not to control for confounding events, (b) the length of the event window, (c) the specification of the return-generating model, and (d) the length and type of the estimation window. The set of methodological choices investigated encompasses all those that researchers must make when designing event studies and that can potentially affect the results[3] (Peterson, 1989; MacKinlay, 1997). Third, prior studies have generally used simulation procedures to evaluate alternative event study methodologies. Simulation techniques require the ex-ante specification of the parameters characterizing the stock-market response to events which, in prior studies, has been constrained to fully occur on a single day and to be constant across all events. In contrast, we use meta-analysis to investigate the impact of distinct methodological choices on 554 estimates of stock market reactions to 32,596 strategic alliances from 110 separate empirical studies. This has three main advantages: (1) because our analysis is based on event studies examining the financial impact of real events, our results reflect more closely the event conditions and statistical properties of actual market responses; (2) by analyzing real, as opposed to synthetically generated, event dates we are able relax the assumption of instantaneous market efficiency and conduct more valid tests for the effects of methodological choices on estimated abnormal returns, such as the length of the event window and the decision of whether to control for confounding events; (3) by analyzing a large number of primary studies, our tests incorporate a variety of empirical situations and research settings which allow us to account for the effect of sample characteristics in our analysis and to increase the generalizability of our findings.

[3] We do not examine the methodological choices associated with the specification of the test statistic because they do not influence the magnitude or direction of estimated abnormal returns.

TABLE 2.1

Overview of studies analyzing the impact of event conditions and methodological choices on event study findings

This table provides an overview of prior research on the impact of event characteristics and methodological choices on event study findings. For each individuals study it describes: (a) whether the study is focused on explaining the influence of research methods on the power of event studies, the magnitude estimated abnormal returns or their significance; (b) the methodological approach used in each study; (c) the characteristics of the sample investigated; (d) the assumptions that each study made about the market response to corporate events; and (e) the types of event conditions and methodological choices investigated in each study.

Study	**Focus and Method**	**Sample**	**Assumptions about Market Response**	**Event Conditions and Methodological Choices Investigated**
Brown and Warner (1980)	*Focus:* Power of event study *Method:* Simulation	*N* = 12,500 *Event type*: Simulated events *Return data*: Monthly returns	- Market reaction fully concentrated on a single month - Magnitude of abnormal returns: 0, 1, 5, 15, and 50% - Constant abnormal returns across all securities	*Event conditions (simulated)* Magnitude of abnormal returns* Event-date uncertainty with 21-month event window* Clustering of event dates* Clustering of events by systematic risk* *Return-generating process* Model specification a*: MEAR, MAAR, MM, PA
Brown and Warner (1985)	*Focus:* Power of event study *Method:* Simulation	*N* = 12,500 *Event type*: Simulated events *Return data*: Daily returns	- Market reaction fully concentrated on a single day - Magnitude of abnormal returns: 0, 0.5, 1, and 2% - Constant abnormal returns across all securities	*Event conditions (simulated)* Magnitude of abnormal returns* Event-date uncertainty with 11-day event window * Non-normality of abnormal returns Clustering of event dates* Non-synchronous trading Serial dependence in abnormal returns* Cross-sectional dependence in abnormal returns* Increase in variance of security returns during the event period* *Return-generating process* Model specification a*: MEAR, MAAR, MM, DB, SW
Dyckman, Philbrick, and Stephan (1984)	*Focus:* Power of event study *Method:* Simulation	*N* = 2,500 – 25,000 *Event type*: Simulated events *Return data*: Daily returns	- Market reaction fully concentrated on a single day Magnitude of abnormal returns: 0, 1, 2, 3, 4 and 5% - Constant abnormal returns across all securities	*Event conditions (simulated)* Magnitude of abnormal returns* Event-date uncertainty with 3- and 5-day event window * Non-normality of abnormal returns* Non-synchronous trading Clustering of event dates* Clustering of events by industry* *Sample selection* Sample size* *Return-generating process* Model specification a*: MEAR, MAAR, MM, DB, SW

Thompson (1988)	*Focus:* Power of event study *Method:* Simulation	*N* = 2,790 *Event type*: Simulated events *Return data*: Daily returns	- Market reaction fully concentrated on a single day - Magnitude of abnormal returns: 1 and 5 % - Constant abnormal returns across all securities	*Sample selection* Confounding events *Return-generating process* Model specification [a*]: MM, MFM
Datta, Pinches, and Narayanan (1992)	*Focus:* Magnitude of estimated abnormal returns *Method:* Meta-Analysis	*N* = - *Event type*: Merger and acquisition announcements *Return data*: Daily and monthly returns		*Sample selection* Confounding events *Length of Event window* Daily and monthly event windows[†]
MacKinlay (1997)	*Focus:* Power of event study *Method:* Simulation	*N* = 1 – 200 *Event type*: Simulated events *Return data*: Daily returns	- Market reaction fully concentrated on a single month - Magnitude of abnormal returns: 0.5, 1, 1.5 and 2 % - Constant abnormal returns across all securities	*Event conditions (simulated)* Magnitude of abnormal returns[*] Variance of abnormal returns[*] *Sample selection* Sample size[*]
McWilliams and Siegel (1997)	*Focus:* Magnitude and significance of estimated abnormal returns *Method:* Replication of 3 event studies	*N1* = 35; *N2* = 34; *N3* = 39 *Event type*: awards for affirmative action programs, firms found guilty of discrimination, and withdrawal from South Africa *Return data*: Daily returns		*Sample selection* Confounding events[†] *Length of Event window* 2-,3-,5-, 11-, and, 41-day windows[†]
This study	*Focus:* Magnitude of estimated abnormal returns *Method:* Meta-Analysis	*N* = 32,596 *Event type*: Strategic alliance announcements *Return data*: Daily returns		*Sample selection* Confounding events *Length of Event window* 1-, 2-,3-, 5-,7-,11-, and 21-day windows[†] *Return-generating process* Model specification [a*]: MEAR, MAAR, MM, SW, PA, MFM Estimation period: length and type

[a] MEAR = mean-adjusted returns, MAAR = market-adjusted returns, MM = market model, DB = Dimson betas, SW = Scholes-Williams betas, PA = portfolio approach, and MFM = multifactor model.

***** Significant influence on the power of event study; † Significant influence on the magnitude of estimated abnormal returns.

Our results show that the length of the event window systematically influences the magnitude of estimated abnormal returns. Specifically, the use of longer event windows tends to be associated with larger abnormal returns, suggesting a gradual adjustment of security prices to new information. Importantly, since studies generally vary in the length of event windows used to estimate and report abnormal returns, this implies that the existence of contradictory findings in extant empirical research may, in part, reflect the use of different event windows. On the other hand, our findings also show the event study methodology to be remarkably robust. We find that the magnitude of the impact of alliance announcements on abnormal returns does not significantly vary with the methodology used and the characteristics of the samples. Specifically, the exclusion of confounding events, the length of the estimation period, and the specification of the return-generating process do not have a significant influence on results. Furthermore, results of published studies do not significantly differ from those of unpublished ones. Results are also remarkably invariant to differences in the industrial composition of the samples. Finally, we find that the magnitude of stock market reactions to alliances announcements has been gradually increasing over time and that it is lower for firms listed on European and Japanese than for those listed on US stock exchanges.

The remainder of the paper is organized as follows. The following section provides the theoretical background regarding the effects of different methodological choices on estimated abnormal returns. The next section then describes the data and methodology used in this study. The third section reports the results of our empirical analysis. The fourth section concludes.

METHODOLOGICAL CHOICES IN EVENT STUDY DESIGN

In this section we discuss how alternative event study methodologies may influence estimated abnormal returns. In event studies, the impact of economic events on firm value is estimated as the difference between the observed returns during the event window and the

normal returns expected to occur in the absence of the event. Thus, estimated abnormal returns may be influenced by two broad classes of methodological choices: (1) choices that may influence the actual returns observed during the event window, and (2) choices that may influence the estimation of expected normal returns. The former include the length of the event window and the treatment of confounding events, while the latter may hinge on the specification of the return-generating process, and the length and type of the estimation window. We now discuss how each of these design choices may influence the magnitude of estimated abnormal returns.

Event Window

Event studies focus on the measurement of stock market reactions to events. Thus, the accurate identification of the event date is an important methodological issue in their design. In event studies, the event date is typically operationalized as the date of the first public release of new information in financial publications such as the *Wall Street Journal*. However, several factors may make it difficult to identify with certainty the exact date at which the event has occurred. First, the market may have had access to event-related information in other forms prior to its publication in the media. Second, the stock market reaction to the event may extend over a number of days following the event date. This occurs, for instance, when trading can only take place on the day following the public release of event-related information or when new information about the event becomes gradually available after the initial announcement date.

Four alternative procedures have been developed to account for uncertainty in the event date (Dyckman et al., 1984; Ball and Torous, 1988). The first approach consists of defining an event window containing the minimum number of days in which the event date may have occurred, and then randomly choosing the event date by using a uniform probability distribution. The second deals with event-date uncertainty by using daily returns

to estimate the parameters of the return-generating model, and then accumulating daily abnormal returns over an expanded event window which comprises the event date and other contiguous days in which stock market reactions may have occurred. The third procedure uses the security returns over a multi-day period to estimate model parameters, and accumulates abnormal returns over this multi-day period. The fourth approach, developed by Ball and Torous (1988), is a maximum likelihood event-study method that incorporates the possibility of event-date uncertainty.

Dyckman et al. (1984) used simulation techniques to investigate the ability of the first three alternative methods to detect abnormal returns. Their results indicated that, under conditions of event-date uncertainty, accumulating abnormal returns over extended event windows provides more statistical power to detect abnormal returns than a random selection of the event date. In addition, they found no additional gains in power associated with the use of multi-day event windows. Ball and Torous (1988) compared the second and fourth approaches and found that both had similar statistical power and thus that no significant gains arise from the use of a more complex estimation framework. Consistent with these findings, event studies generally deal with event-date uncertainty by adopting the second approach which involves accumulating abnormal returns over an event window comprising multiple days around the announcement date.

However, this procedure has also limitations. Simulation studies by Brown and Warner (1980, 1985), Dyckman et al. (1984), and MacKinlay (1997) have consistently shown that, although the use of longer event windows is preferable to the random selection of an event date, increasing the length of the event window still considerably decreases the statistical power of an event study relative to the use of shorter event windows. Previous research also suggests that the length of the event window may influence the magnitude of the observed abnormal returns. McWilliams and Siegel (1997) investigated these effects by

reexamining three event studies on corporate social responsibility. They found that, for this limited sample of studies, the size of the event windows influenced the magnitude of estimated abnormal returns.

Uncertainty in the event date would suggest that larger event windows would capture more accurately the full effects of specific events on firm value and would thus lead to larger observed abnormal returns in absolute value. However, extending event windows beyond the period required to capture stock market reactions to information released prior to, or immediately following, the event date may dilute the estimated effects on firm value due to the inclusion of security returns for days not influenced by the event. Thus, since short event windows account for event-day uncertainty and are also less likely to include security returns not affected by the event, they should be associated with larger abnormal returns in absolute value than relatively broader event windows.

Confounding Events

Event studies are based on the assumption that the estimated abnormal returns are caused by a particular event. This assumption provides the foundation for interpreting results and for inferring causality in event studies. However, the validity of this assumption is contingent on the non-occurrence of other events close to the event date. Specifically, when other confounding events that influence firm value occur during the event window, they distort the link between the event of interest and abnormal returns. Confounding events result from all releases of unanticipated information that have an economic impact on the focal firm, such as earnings announcements. The presence of confounding events may lead to the dilution or reinforcement of the estimated abnormal returns, increasing the probability of rejecting the presence of an effect when it exists (type II error) or that of identifying an effect when it does not (type I error) (Meznar, Nigh, and Kwok, 1998). Dilution occurs when the impact of confounding effects on firm value is random across the sample of firms, or when

confounding events have a systematic effect on firm value that works contrary to the event of interest. Reinforcement occurs when the stock market impact of confounding events is systematic and in the same direction as the event of interest.

Foster (1980) identified several alternative approaches to control for confounding events. The first consists in partitioning the firms in the sample on the basis of the type of confounding events that have occurred during the event window, and estimating the separate effects of the confounding events on firm value. An alternative approach consists of excluding from the sample firms that have experienced confounding events. A third procedure involves excluding from the sample the days when confounding events have occurred. This solution may lead to an underestimation of the impact of the focal event on firm value when the information released in the confounding event is related to that event. A fourth alternative consists of correcting the observed abnormal returns by subtracting the estimated financial impact of the confounding events. A final procedure assumes that, under conditions of temporal dispersion of event dates and variation in the type and expected impact of confounding events, the net effect of confounding events is minimal and, therefore, that no control is required. Event studies have typically adopted the second approach, excluding from the sample firms that have confounding events, or the fifth one, not controlling for such events. Indeed, our review of the empirical literature on stock market reactions to strategic alliance announcements indicates that in this research literature only these two methods have been used to control for confounding events.

Prior research provides conflicting evidence on the impact of confounding events on the magnitude of the observed abnormal returns. In a meta-analysis of 41 event studies using monthly and daily returns to estimate the stock market reactions to mergers and acquisitions, Datta, Pinches, and Narayanan (1992) found that estimated abnormal returns for bidders were marginally higher in studies that did not control for confounding events relative to those that

excluded confounding events from the sample. McWilliams and Siegel (1997) reexamined three event studies on corporate social responsibility and found that failing to account for confounding events led to significantly larger abnormal returns for all studies. However, in general, the direction and size of the bias introduced by confounding events will depend on the extent to which they tend to be random or systematic, and how they will affect abnormal returns is hard to predict a priori.

Return-Generating Process: Model Specification

The measurement of abnormal returns requires the estimation of normal returns, that is, the expected security returns in the absence of the economic event under study. There are several methodologies available for modeling a firm's normal returns. The market model is most frequently used (MacKinlay, 1997). It assumes that the normal return for a given security is a linear function of the contemporaneous market return. The market model for security *i* is:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \qquad (1)$$

where R_{it} and R_{mt} are the returns for security *i* and the market portfolio *m* in period *t*, respectively, α_i and βi are the intercept and market beta coefficient for security *i*, and ε_{it} is the disturbance term for security *i* in period *t*, with $E[\varepsilon_{it}] = 0$ and $\text{Var}[\varepsilon_{it}] = \sigma_i^2$.

In principle the model parameters α_i and β_i are to be estimated based on empirical market data or alternatively constrained to a certain value. Two model specifications of the return-generating process, the mean-adjusted returns model and the market-adjusted returns model, involve imposing restrictions on market model parameters. The mean-adjusted returns model is based on the assumption that the normal return for each security is constant over time. This implies that securities are not sensitive to market returns and, thus, that β_i is constrained to be zero. In contrast, the market-adjusted returns model assumes that all securities generate normal returns equal to the return on the market index for the period under

consideration. Therefore, in the market-adjusted returns model α_i and β_i are constrained to zero and unity, respectively.

Methodological extensions of the market model have been developed to correct for potential biases in the estimation of its parameters arising from nonsynchronous trading of securities (Scholes and Williams, 1977; Dimson, 1979). The market model has also been extended to include other factors in addition to stock market indexes[4] (MacKinlay, 1997). These multifactor models may include indexes based on industry classification (Thompson, 1988), global market movements (Park, 2004), or macro-economic factors, such as interest rates (Chang, 1991), exchange rate movements (Park, 2004), and inflation (Roll, 1992).

The control portfolio methodology provides an alternative approach to adjust a security's observed return for market influences during the event window. This methodology assumes that the return-generating process is equivalent across firms similar in market value of equity (Fama and French, 1992), market beta coefficient (Brown and Warner, 1980), or industry membership (MacKinlay, 1997). Therefore, abnormal returns are estimated as the difference between the observed return for the focal firms and the return for a control portfolio comprising similar firms without event announcements.

Brown and Warner (1980, 1985), and Dyckman et al. (1984) have examined the influence of these alternative ways of modeling normal returns on the statistical power of event studies. Their results consistently indicate that model specification has little or no impact on the power to detect abnormal returns. However, prior research has not addressed the extent to which they affect the *magnitude* of estimated abnormal returns.

[4] The choice of market index may influence estimated abnormal returns (Brown and Warner (1980). Since market indexes potentially differ in the degree to which they are correlated with security returns, they may lead to different model parameters and to different estimates of normal returns. In our sample, most of the variation among studies in the type of market index used was associated with differences in the nationality of the firms being investigated. Accordingly, event studies based on the same country did not generally differ in their choice of market index. Because in our sample the choice of market index is empirically confounded with country effects we do not explicitly model the influence of market index on estimated abnormal returns.

Estimation Period

The parameters of the return-generating model are estimated using return information for a period of time that may include, precede, follow, or surround the event window. The specification of this estimation period may influence the predicted normal returns and, therefore, the magnitude of the observed abnormal returns. Specifically, the impact of the estimation period on estimated abnormal returns is contingent on the stability of the return-generating process parameters over time. In particular, the extent to which the parameters of the return-generating model estimated for the entire estimation period are valid for the event window influences the accuracy of the predicted normal returns. Transitory or permanent shifts in the parameters of the return-generating process may occur during the estimation period, or during the event window as a consequence of the event. *Long* estimation periods increase predictive accuracy of the return-generating model by attenuating the relative influence of transitory parameter shifts, and by reducing the estimated standard errors when parameter estimates are stable during the estimation window. Conversely, *short* estimation periods that are close to the event window increase the sensitivity of parameter estimates to shifts in the return generating process. Thus, short estimation periods improve the ability to predict normal returns when permanent parameter shifts occur during the estimation period. Event studies have used estimation periods that combine pre-event and post-event data to increase predictive accuracy when parameter shifts are triggered by the event of interest (Peterson, 1989).

In sum, in the absence of parameter shifts, the length and type of estimation periods should have no influence on observed abnormal returns. In contrast, estimation periods that are short and include post-event data should provide more accurate estimates of abnormal returns when parameter shifts occur during the estimation period or the event window.

DATA AND METHODOLOGY

To investigate the impact of alternative event study methodologies on the magnitude of estimated abnormal returns we conducted a meta-analysis of event studies examining the effect of strategic alliance announcements on firm value.

Meta-analysis is a statistical procedure for integrating the results of a large number of empirical studies (Hedges and Olkin, 1985; Hunter and Schmidt, 1990). By using the results of each estimate of the abnormal returns associated with strategic alliance announcements as a data point, we can use meta-analysis to test whether the use of certain methods leads to systematic variations in the magnitude of abnormal returns while controlling for sample characteristics (Miller and Pollock, 1994).

Strategic alliances are voluntary contractual agreements for governing horizontal or vertical exchanges between firms, and may serve a variety of motives such as market entry or new product development (Hennart, 1988). They can take a multitude of equity and non-equity forms such as joint ventures or licensing agreements, and their incentive structure differs from other alternative governance mechanisms, such as spot market transactions or complete ownership through internal development or acquisitions (Hennart, 1988). We focus on strategic alliances because they have attracted a large volume of empirical research using the event study method, and are a prevalent mode of corporate development (Gulati, 1998). In fact, between 1990 and 1999 Fortune 100 companies announced more than twice as many alliances (6,620) than acquisitions (2,936) (McGahan and Villalonga, 2003).

Prior empirical research on the impact of strategic alliances on firm value has produced inconsistent results: while some studies have found that the announcement of strategic alliances creates value for the participating firms (e.g., Chan, Kensinger, Keown, and Martin, 1997), others have found it destroys it (e.g., Lee and Wyatt, 1990). Importantly, our review of the literature also indicates that individual studies have differed considerably in

the methodological choices researchers have made to estimate the abnormal returns associated with alliance announcements. Thus, by using meta-analysis we can investigate whether the choice of event study methodology accounts for the variability in study results.

Literature Search

We combined multiple search strategies to identify published and unpublished empirical studies that used the event study methodology to evaluate the impact of strategic alliance announcements on firm value. First, articles were identified through a computer bibliographic search of electronic databases. ABI/Inform, Econlit, JSTOR, Kluwer Online, Science Direct, and the Social Science Citation Index were searched using the keywords "joint venture(s)", "strategic alliance(s)", "performance", "event study", "shareholder value", "abnormal return(s)", "wealth effect(s)", "residual(s)", "prediction error(s)", "excess return(s)", "announcement(s)", and "firm value". Second, we performed manual searches (over the 1980 to 2004 period) of relevant journals in finance, accounting, management, and marketing (*Academy of Management Journal, Journal of Accounting Research, Journal of Finance, Journal of Financial Economics, Journal of International Business Studies, Journal of Management, Journal of Marketing, Journal of Marketing Research, Strategic Management Journal*). Third, we performed Internet searches using standard search engines. Fourth, we requested working papers from authors of previous event studies. Finally, we examined the reference sections of all the articles retrieved and of prior narrative reviews of the strategic alliance literature (Gulati, 1998; Merchant, 2000).

Studies were considered eligible for the meta-analysis if they reported on the effects of strategic alliance announcements on firm value, measured in abnormal returns. In addition, to be included in our database, the study had to be based on daily returns. This search process yielded 110 empirical studies (including 34 unpublished papers) from which we obtained 554 estimates of the impact of strategic alliances announcements on firm value. Because some

studies provided information on more than one independent sample, our analysis is based on 140 independent samples with a total sample size of 32,596 strategic alliances announced between 1963 and 2001.

Coding

For each study, two judges independently coded all relevant information, as detailed below. The level of interrater reliability for coding decisions was 97%. Inconsistencies were resolved through discussion.

The judges coded the sample size and the abnormal returns for the parent firms over eight distinct event windows ranging from the day of the strategic alliance announcement (day 0) to a 21-day window surrounding the announcement day. They also coded the methodology used and the sample characteristics. The methodological variables coded were (a) the length of the event window, (b) the length of the estimation period, (c) whether the estimation period preceded the event window or also included a post-event period, (d) the model specification of the return-generating process, and (e) whether confounding events were excluded from the sample. The variables characterizing the sample included (f) the mean year of the alliance announcements included in the sample, (g) the percentage of strategic alliances in manufacturing industries, and (h) the country of the stock exchange in which the announcing firms were listed. Controlling for the sample characteristics of the event study allows us to empirically examine the consistency of results across a wide range of countries, time periods, and industry settings. Finally, we tested for the presence of publication bias and therefore coded (i) the publication status of the study (published vs. unpublished). Publication bias is present if the probability that a study is published is contingent on the magnitude, direction or significance of the study's results (Begg, 1994).

Meta-Analysis Model

To investigate the influence of methodological choices on the magnitude of estimated abnormal returns, we separately modeled the abnormal returns obtained for event window *l* in study *k* (AR_{lk}) as a function of a set of methodological choices and sample characteristics, denoted as $X_{j,lk}$ (Hedges and Olkin, 1985; Stanley, 2001). Most studies in our sample report estimates of the abnormal returns associated with strategic alliances for multiple event windows of varying lengths. Since these distinct events windows generally overlap, individual estimates from the same study are not independent. Therefore, in order to obtain accurate estimates of the effects of methodological choices and sample characteristics on event study findings, we need to account for within-study dependency between the abnormal returns estimated for different event windows. Hierarchical linear models, also termed multilevel models, provide a statistical method for directly modeling the dependency between multiple estimates of abnormal returns obtained from the same study (Raudenbush and Bryk, 2002). Hierarchical linear models are random-coefficient regression models for analyzing nested data structures, such as event windows within studies. In hierarchical models the effects of variables associated with different levels of the hierarchy are simultaneously estimated. In addition, because effect sizes based on larger samples contain less sampling error, we use the sample size as a weight in our analysis (Rosenthal, 1991). In particular, we separately estimated the following weighted hierarchical linear model (Bijmolt and Pieters, 2001):

$$AR_{lk} = \gamma_0 + \sum_{j=1}^{J} \gamma_j X_{j,lk} + e_{lk} + u_k \qquad (2)$$

where we assume that the within-study error components e_{lk}, and the between-study error components u_k are normally distributed with zero mean and variances ς^2 and τ^2, respectively. Prior to estimating the hierarchical linear model we examined potential collinearity between the measures capturing the event study methodology and sample

characteristics. Examination of variance inflation factors (VIF) and conditioning index (CI) statistics indicated a low level of collinearity with no important effects for model estimation (maximum VIF = 6.03, maximum CI = 5.942). This result suggests that there is little co-variation among distinct methodological choices and sample characteristics, indicating that in prior event studies on strategic alliances methodological choices are generally been made independently of each other. This supports our goal of investigating how the choice of event study methodology impacts the estimated abnormal returns across a wide range of event conditions, methodological choices and research settings.

RESULTS

Study Characteristics

Figure 2.1 presents the frequency distribution of the estimated abnormal returns associated with strategic alliance announcements. The mean estimated abnormal return is 0.74 percent (median = 0.52), and the standard deviation is 1.22 indicating substantial variation in study findings. In addition, 83 percent of the estimated abnormal returns are positive. Table 2.2 shows how event study methodology and sample characteristics vary across the 554 estimates of the effect of strategic alliances on firm value in our sample. There is greater heterogeneity between studies in the length of the estimation period and in the treatment of confounding events than in model specification and in the type of estimation period adopted. Specifically, most studies model normal returns using a market model specification estimated on the basis of historical security returns for a period of time preceding the event. In terms of empirical context, studies capture a wide range of industries and time periods, but are skewed heavily toward analyzing the financial effects of strategic alliance announcements on firms listed on US stock exchanges.

FIGURE 2.1
Frequency distribution of estimated abnormal returns

This figure reports the frequency distribution of 554 estimates for the abnormal returns associated with strategic alliance announcements for 32,596 strategic alliances formed between 1963 and 2001.

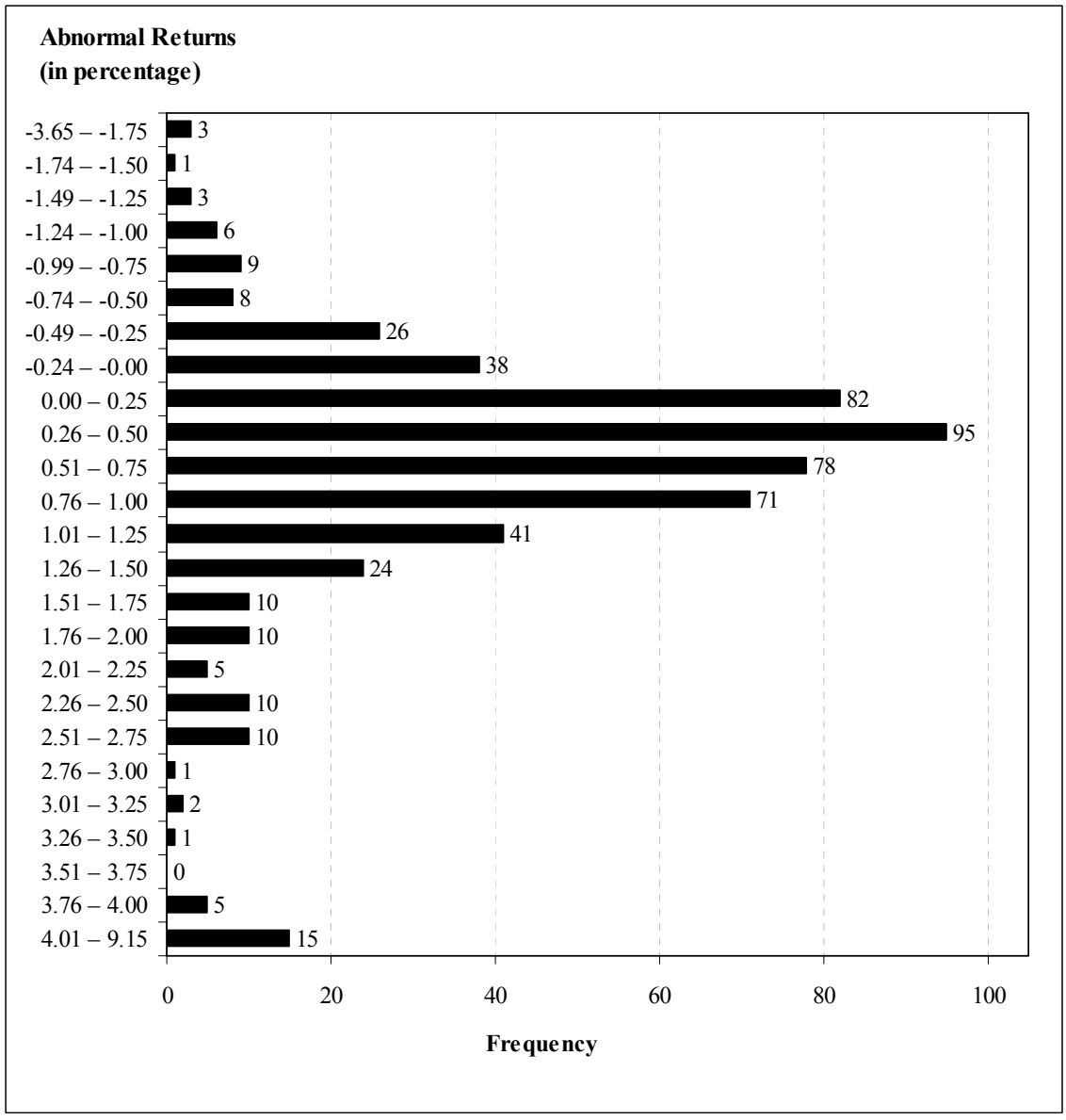


TABLE 2.2
Application of Event Study Methodology in Strategic Alliance Research

This table provides an overview of the how the event study method has been applied to investigate the impact of strategic alliance announcements on firm value. It reports the number of empirical tests based on different choices of event study methodology and sample characteristics. Variables pertaining to the event study methodology include: the length of the event window, the decision of whether or not to control for confounding events, the model specification of the return-generating process, the type of estimation period, and the length of the period used to estimate the parameters of the return-generating model. Variables pertaining to sample characteristics include: the time frame of the sample (mean year of the alliance announcements included in the sample), the nationality of the firms announcing strategic alliances, the percentage of strategic alliance announcements in manufacturing, and the whether the study was published or unpublished.

Event Study Methodology	**Number of Estimates**	**Sample Characteristics**	**Number of Estimates**
Event Window		Country	
0 (announcement day)	81	U.S.	432
(-1,0)	117	Europe	74
(0,1)	77	Japan	20
(-1,1)	85	Australia, South-East Asia	28
(-2,2)	60	Percentage of Alliances in Manufacturing	
(-3,3)	43	0 to 55	164
(-5,5)	44	56 to 70	242
(-10,10)	47	71 to 100	148
Confounding events		Year of Announcement	
Not controlled for	267	1975-1979	66
Controlled for	287	1980-1984	92
Model Specification		1985-1989	141
Market Model	403	1990-1994	186
Mean Adjusted Returns	21	1995-2000	69
Market Adjusted Returns	12	Publication Status	
Scholes-Williams Betas	38	Unpublished	121
Multifactor Model	28	Published	433
Portfolio approach	52		
Type of Estimation Period			
Pre-event period	492		
Pre- & Post-event period	62		
Length of Estimation Period (in days)			
45 to 120	167		
121 to 150	174		
151 to 200	102		
201 to 662	111		

Effect of Strategic Alliances on Firm Value

We first estimated a random-effects model that includes only an intercept term. This model provides a baseline against which to compare more complex models. Our findings, presented in Table 2.3 (Model 1) indicate that the variance is 39.20 at the within-study level and 1.28 at the between study-level. This corresponds to an intra-study correlation of 0.97, indicating that, as expected, abnormal returns obtained from the same study are highly correlated and, therefore, that a hierarchical linear model should be estimated to account for this dependency. Finally, the intercept provides an estimate of the overall magnitude of the abnormal returns associated with strategic alliance announcements that also corrects for within-study dependency between the observed abnormal returns. The parameter estimate of 0.80 ($p < 0.001$) indicates that, on average, strategic alliances create shareholder value as they result in an increase of 0.80 percent in abnormal returns.

Effects of Event Study Methodology on Research Findings

We now examine whether and how the use of particular methodologies and sample characteristics influence the magnitude of abnormal returns by estimating a hierarchical linear model that includes all predictor variables (Model 2, Table 2.3). To evaluate model fit we compare the deviance (-2 times the log-likelihood) of the full model (Model 2) with the deviance of the baseline model (Model 1). The difference between these deviances is distributed asymptotically as chi-square, with degrees of freedom equal to the difference in the number of parameters estimated (Raudenbush and Bryk, 2002). The deviance statistics of the full model (1234.0) compares favorably with the baseline random-effects model (1309.3) indicating an increase in model fit ($\chi^2(24) = 75.3$, $p < 0.001$).

TABLE 2.3

Regression Analysis of Estimated Abnormal Returns on Event Study Methodology and Sample Characteristics

This table reports the results from a weighted hierarchical linear regression analysis of the estimated abnormal returns associated with strategic alliance announcements obtained for event window *l* in study *k* (AR_{lk}). Regressors include two sets of variables. The first set of variables includes the following characteristics pertaining to the event study methodology used in each article to estimate abnormal returns: dummy variables indicating the length of the event window, a dummy variable indicating whether confounding events were excluded from the sample of strategic alliance announcements, dummy variables indicating the return-generating model specification used to estimate normal returns, a dummy variable indicating whether the estimation period includes both pre- and post-event periods, and the length of the period used to estimate the parameters of the return-generating model. The second set of variables includes the following characteristics of the sample of strategic alliance announcements used in each study: dummy variables indicating the mean year of the alliance announcements included in the sample, dummy variables for the nationality of the firms announcing strategic alliances, the percentage of strategic alliance announcements in manufacturing, and a dummy variable indicating whether the study was published in a peer-reviewed journal. Each parameter was weighted by the study's sample size. Standard errors are in parentheses.

	Model	
	1	**2**
Event Window		
(-1,0)		0.270*** [a]
		(0.063)
(0,1)		0.221*** [a]
		(0.068)
(-1,1)		0.445*** [b]
		(0.066)
(-2,2)		0.459*** [b]
		(0.073)
(-3,3)		0.547*** [b,c]
		(0.090)
(-5,5)		0.510*** [b,c]
		(0.077)
(-10,10)		0.649*** [c]
		(0.085)
Confounding events		0.142
		(0.090)
Model Specification		
Mean Adjusted Returns		0.624
		(0.651)
Market Adjusted Returns		0.652
		(0.525)
Scholes-Williams Betas		0.338
		(0.461)
Multifactor Model		-0.194
		(0.197)

Portfolio approach		-0.225
		(0.497)
Estimation Period		
Pre- & Post-event period		-0.562
		(0.428)
Length of Estimation Period (in		0.125
100 days)		(0.098)
Country		
Europe		-0.814**
		(0.334)
Japan		-1.276***
		(0.305)
Australia, South-East Asia		-0.230
		(0.492)
Percentage of Alliances in Manufacturing		-0.516
		(0.404)
Year of Announcement		
1980-1984		-0.183
		(0.479)
1985-1989		0.335
		(0.422)
1990-1994		0.260
		(0.431)
1995-2000		0.844*
		(0.475)
Published		-0.320
		(0.251)
Intercept	0.800***	0.604
	(0.103)	(0.534)
-2 log likelihood	1309.3***	1234.0***
Chi-square	487.72***	504.22***
N	554	554
Within-study variance	39.20***	29.89***
Between-study variance	1.28***	1.52***

***, **, * Significant at the 1, 5, and 10 percent levels, respectively.
[a,b,c] Values sharing a superscript are not significantly different at the 5 percent level.

First, our findings show that the length of the event window influences the magnitude of estimated abnormal returns. We assessed whether the magnitude of estimated abnormal returns differed across the various event windows by testing a series of equality constraints between the regression coefficients associated with the different event windows (Verbeek, 2000; p. 25). We find that the use of longer event windows is associated with larger estimates of abnormal returns, but that this effect levels off beyond a 7-day period surrounding the event. Thus, rather than information associated with strategic alliance announcements being instantaneously incorporated in security prices, markets appear to react gradually to this type of corporate event. This result has important implications as it suggests that the length of the event window is an important consideration when interpreting study findings and comparing results from different studies. Specifically, our results show that contradictory evidence regarding the effect of corporate events, such as strategic alliances, on firm performance may be at least partially explained by variations in the length of the event window used to estimate these results. Hence, it is important to estimate and report abnormal returns over multiple event windows of increasing lengths to ensure that the market has fully absorbed the effects of corporate events on security prices. In the case of strategic alliances, our results show that these event windows must extend to a 7-day period surrounding the announcement day. Because alliances are, in their volume, complexity and implications, comparable to other modes of organizational expansion and contraction, this finding may generalize to other types of corporate announcements. Hence the inconsistent results found in prior research on the financial effects of corporate events such as divestitures (Meznar, Nigh, and Kwok (1998) or mergers and acquisitions (King, Dalton, Daily, and Covin, 2004), may be in part due to variations in the reported event windows. Thus, when comparing results across studies researchers should consider the length of the event window as an important source of variability in empirical findings.

Second, contrary to both our expectations and to the findings of prior research based on the replication of individual studies (McWilliams and Siegel, 1997), controlling for confounding effects appears to have no significant impact on the magnitude of estimated abnormal returns. A potential explanation for this result may be that few unanticipated events confounded the strategic alliance announcements in the included samples. Alternatively, this result may also be interpreted as indicating that confounding events are randomly distributed across strategic alliance announcements with an expected value of zero. Importantly, this suggests that event study findings are robust to the presence of confounding events. In other words, the assumption made by many event studies that confounding events were absent or non-influential seems to be, on average, correct. This matters because excluding potentially confounded observations, a method often used to handle confounding events, may introduce selection biases in the sample, as the presence of potentially confounding corporate events may be related to a number of organizational characteristics such as firm size.

Third, our results indicate that the use of alternative model specifications has no significant effect on the magnitude of observed abnormal returns. Brown and Warner (1985) and Dyckman et al. (1984), using simulation, found that alternative specifications of the return-generating process tend to have similar statistical *power* for detecting abnormal returns. Here we show that this conclusion also applies to the *magnitude* of estimated abnormal returns and to a broad set of model specifications including multifactor models and the portfolio approach.

Event studies in our sample differ in both type and length of estimation period. We find that including post-announcement observations in the estimation period does not have a significant influence on estimated abnormal returns. This finding shows that either alliance announcements do not generally cause significant parameter shifts during the event window, or that event study methodologies are robust to such shifts. Similarly, we find that the length

of the estimation period has no significant influence on the magnitude of estimated abnormal returns. This suggests that model parameters are generally stable over time, and that the choice of the length of the estimation period is not critical to capture a security's return dynamics.

Sample Characteristics

We now examine whether sample characteristics influence estimated abnormal returns. First, results from the hierarchical linear model (Model 2, Table 2.3) indicate that estimated abnormal returns have gradually increased over time[5] (year of announcement), with strategic alliances announced between 1995 and 2000 having a higher impact on market value than those announced in earlier periods. One possible explanation is that firms have generally become better at creating value in strategic alliances, i.e. that they are now more successful at identifying complementarities with other firms, choosing appropriate governance structures, and managing interfirm collaboration. Alternatively, these results may also reflect a gradual change in investors' subjective response to strategic alliance announcements.

Second, our results for the country of the parent firms suggest that listing location and thus stock market characteristics do influence the magnitude of estimated abnormal returns. Specifically, we find that stock market reactions to strategic alliance announcements tend to be lower for firms listed on European and Japanese than for firms listed on US stock exchanges. We assessed whether stock market reactions to alliance announcements differed between firms listed on European as opposed to Japanese stock exchanges by testing the null hypothesis of equality between their respective regression coefficients (Verbeek, 2000). Our analysis revealed that no significant differences exist between these two economic regions. Third, we find that the industry composition of the sample (i.e., the proportion of

[5] We also used three- and seven-year windows and the results remained unchanged. These analyses are available from the authors upon request.

manufacturing firms in the sample) has no significant effect on estimated abnormal returns.

This indicates that results are fairly similar between manufacturing and service industries.

Publication Bias

We examine the presence of a publication bias by investigating whether there are systematic differences in abnormal returns between published and unpublished studies. Table 2.3 (Model 2) shows that this is not the case, which supports the absence of a publication bias.

CONCLUSIONS

The event study method has been used to investigate a wide range of topics in finance, accounting, economics, industrial organization, law, and management. However, empirical studies differ considerably in the particular event study methodology employed. This variety reflects not only the development of many modifications to the event study method since the pioneering works of Ball and Brown (1968) and Fama et al. (1969), but also differences in the methodological choices made by researchers. The diversity in methodological practices raises an important question regarding the interpretation of past event studies and the design of new ones, namely whether and how the choice of event study methodology influences the magnitude of estimated abnormal returns. In the present paper, we perform a meta-analysis of 554 estimates of stock market reactions to strategic alliance announcements to explore whether a number of methodological choices affect the magnitude of estimated abnormal returns. These choices include (a) the length of the event window, (b) the decision to exclude confounding events, (c) the model specification of the return-generating process, and (d) the type and length of the estimation period.

We obtain several important results. First, we find that the use of longer event windows is associated with larger estimated abnormal returns. Therefore, rather than being

instantaneous, stock market reactions to alliance announcements appear to unfold gradually over a period of 7 days surrounding the announcement day. This may reflect a process of uncertainty reduction as information becomes progressively available, for instance as the first announcement is followed by others providing additional information on the goals and structure of the alliance. Because this finding has important implications for the interpretation of prior research using the event study method and for our understanding of market efficiency (Fama, 1991), future research could examine whether our findings regarding the stock market response to strategic alliances generalize to other types of corporate announcements.

Second, we find that, surprisingly, including confounding events has no significant impact on estimated abnormal returns. This may indicate that strategic alliances are generally isolated corporate events, or that confounding events surrounding strategic alliance announcements tend either to be anticipated, or that they are randomly distributed with mean zero.

Third, we find that event study results are remarkably robust to the use of alternative methodologies for modeling and estimating expected normal returns. Specifically, the length and type of the estimation period and the model specification of the return-generating process do not significantly affect estimated abnormal returns This is consistent with prior research that has examined the power of alternative methodologies for modeling the return-generating process (Brown and Warner, 1980, 1985) and Dyckman, et al., 1984). Thus, alternative methodologies for modeling normal returns do not seem to differ significantly in their ability to estimate the strength of this effect. In addition, our findings strongly indicate that the effects of strategic alliance announcements are consistent across samples that vary in industrial composition.

Finally, we find that the impact of strategic alliance announcements on firm value has gradually increased over time and that it is lower for firms listed on European and Japanese

than for firms listed on US stock exchanges. This may reflect national differences in stock market reactions to corporate events, or systematic differences in the characteristics of strategic alliances formed by European and Japanese firms compared to those formed by U.S. firms. Future research could explore in more detail the factors underlying this difference.

Although this study focused on event studies examining the impact of strategic alliances on firm value, two factors increase our confidence in the generalizability of our findings to other types of corporate events. First, strategic alliances are amongst the most frequent modes of corporate development (McGahan and Villalonga, 2003) and are close substitutes to internal growth and acquisitions (Hennart and Reddy, 1997). Second, the methodological heterogeneity we observe in our sample is similar to that in other event studies, such as those of the impact of mergers and acquisitions (Halpern, 1983; King et al., 2004).

Our study also illustrates how meta-analysis can be used to integrate empirical evidence in the field of finance. Meta-analysis has emerged as crucial methodology for the cumulation of empirical evidence across a large number of disciplines. For instance, meta-analysis has been used in management research to examine, amongst other issues, the link between the composition of the board of directors and financial performance (Dalton, Daily, Ellstrand, and Johnson (1998) and the link between firm diversification and performance (Palich, Cardinal, and Miller, 2000). Meta-analysis can contribute in several ways to the development and testing of theories in finance. In particular, meta-analysis may be used: (a) to synthesize empirical evidence on the relationship between variables, (b) to investigate the generality and boundaries of an empirical relationship by examining sources of variability among study findings, and (c) to examine the influence of variables that have not been examined in prior research but that can be explored by contrasting different studies (Miller and Pollock, 2004).

In conclusion, the findings reported in this paper have implications for research using the event study method. Our results show that the length of the event window and the national origin of the stock exchange in which the announcing firms are listed are crucial elements to be considered not only when interpreting and comparing past empirical estimates of stock market reactions to corporate events, but also for the design of new event studies.

CHAPTER THREE[6]

DO FIRMS BENEFIT FROM ENTERING STRATEGIC ALLIANCES? AN INTEGRATIVE REVIEW AND META-ANALYSIS

STRATEGIC ALLIANCES–voluntary contractual agreements between firms to govern the coordination, sharing, exchange, or combination of assets, knowledge, capabilities, or activities–are a pervasive organizational phenomenon of central interest to organizational scholars and managers. Managerial interest in alliances arises from the assumption that strategic alliances create value for firms entering them. This is reflected in the prevalence, both in relative and absolute terms, of strategic alliances as modes for corporate development. Between 1990 and 1999 over 40,270 strategic alliances were announced involving at least one U.S. firm, compared to 46,766 mergers and acquisitions, 5,103 initial public offerings, and 454 spinoffs (Robinson, 2001). Strategic alliances seem to be even more pervasive among the largest U.S. firms. In a study of eighty-six Fortune 100 companies, McGahan and Villalonga (2003) found that, over the same period, alliances accounted for over 57 percent of all external corporate development activities (i.e., alliances, mergers and acquisitions, and divestures), with twice as many alliances being formed than mergers and acquisitions. From computer manufacturers to financial services, from the United States to Japan, from research

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and development to marketing, the incidence of strategic alliances as primary modes for organizing economic activity extends across a wide range of industries, countries, and activities (Barfield and Thum, 2003).

Scholarly interest in strategic alliances has paralleled their rising importance as modes of corporate development. This has led to the emergence of a substantial, and growing, volume of theoretical and empirical research on the formation, governance, evolution and performance of strategic alliances (for a review, see Gulati, 1998). Of the various causes and consequences of strategic alliances the effect of such partnerships on the performance of participating firms is perhaps the most crucial since the expectation that alliances create value is the primary driver of alliance formation (Stuart 2000). Yet, while prior research has led to valuable insights on the effects of alliances on firm performance, the empirical evidence provides no consensus on whether or not alliances create value for participating firms and on the magnitude of these effects (Reuer, 2004). Indeed, while some studies have found that alliance announcements create firm value (e.g., Chan, Kensinger, Keown and Martin, 1997) others have shown that they destroy it (Lee and Wyatt, 1990). As Gulati noted in his review of the literature, "results provide mixed evidence of the beneficial consequences of alliances for firms entering them" (1998: 309). Given the inconsistencies in prior empirical results it is thus important to determine what is, on average, the impact of strategic alliances on firm value.

Questions also exist about the factors which account for the variability in the value created by alliances. For instance, do the economic gains of alliances vary according to their governance structure (equity vs. non-equity) or their geographic or market scope? While a large number of studies have addressed these issues, empirical research has not always been cumulative. Prior studies have adopted a plurality of distinct theoretical perspectives (Kogut, 1988; Reuer, 2004) and used a large number of different variables to explain the relationship

between strategic alliances and firm value. Indeed, our review of the empirical literature indicates that 90 distinct variables have been used, of which 32 have been investigated in three or more studies and 48 have been investigated only once. Moreover, although previous studies have examined the influence of a variety of factors there has been no shared theoretical framework for explanatory variables. Evidence has been piecemeal since studies investigate, on average, the influence of just five variables on the alliance-firm value link. Finally, for several factors for which there is cumulative evidence, such as the performance consequences of alliance experience, there is little consistency in findings across studies. For instance, while some studies have found that by accumulating alliance experience firms can learn to create value in strategic alliances (e.g., Kale, Dyer, and Singh, 2002), others did not (e.g., Merchant and Schendel, 2000). Thus, despite the large number of studies, the extent to which firms derive economic benefits from strategic alliances, and the factors that influence their impact on firm value have not yet been firmly established.

The purpose of the present paper is to theoretically and empirically clarify what is known about the effects of individual strategic alliances on the performance of firms entering them by reviewing and synthesizing major theoretical perspectives and using meta-analysis to provide a systematic, quantitative analysis of whether and how firm value is created in strategic alliances. Meta-analysis provides a valuable method for integrating and interpreting the results of empirical studies, particularly when they are contradictory (Cooper and Hedges, 1994). Meta-analysis transforms study findings into a common metric, which in management research is typically a correlation coefficient. The procedure then involves using statistical methods to estimate with precision the average level of an effect and to identify potential sources of variation in results. Our meta-analysis is based on a sample of 110 studies examining the performance effects of 32,596 strategic alliances.

THEORY AND HYPOTHESES

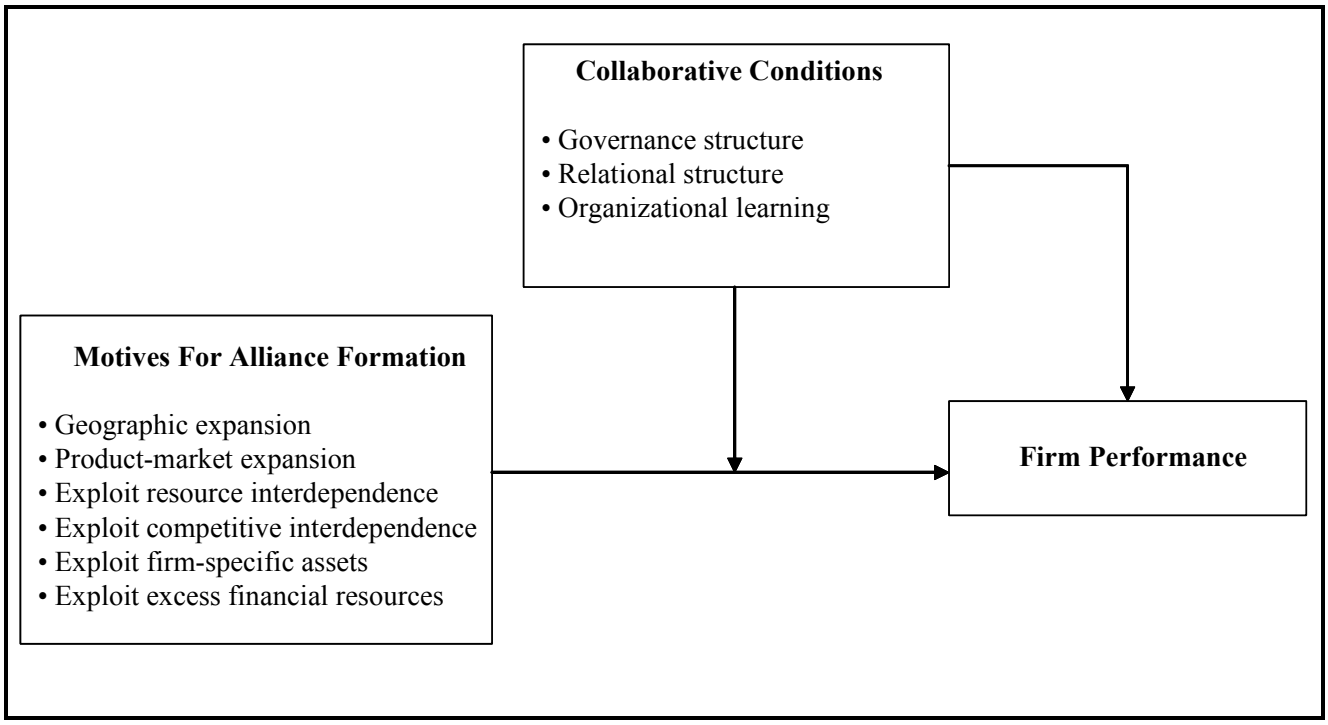
Strategic alliances are formed for a variety of reasons. Firms may establish alliances to increase market power (e.g., Berg, Duncan, and Friedman, 1982), foster innovation (e.g., Rothaermel, 2001), learn or access new knowledge and capabilities (e.g., Inkpen, 2002; Mowery, Oxley, and Silverman, 1996), enter new domestic or international markets (e.g., Hennart, 1991), create real options in uncertain environments (e.g, Kogut, 1991), reduce risk through diversification (e.g., Reuer and Ragozzino, forthcoming), or combine similar or complementary assets to obtain economies of scale or scope (e.g., Hennart, 1988). Underlying these distinct motives is the notion that strategic alliances are created to exploit, in circumstances of market failure, interdependencies between assets, knowledge, capabilities, or activities that are controlled by different firms and can be shared at low marginal costs (Hennart, 1988).

However, the identification of interdependencies between firms and the formation of alliances to derive value from these interdependencies only creates the *potential* for gains in firm performance. Importantly, the collaborative conditions under which these interdependencies are exploited can also have a significant influence on the extent to which the partner firms are able to fully realize this potential for value creation and effectively translate it into relational rents. Collaborative conditions, as defined in this paper, include the structural characteristics of the alliance and the characteristics of the partnering firms that shape the cooperative behavior of the firms in the alliance. Below we build on previous research to develop hypotheses on how the motives for alliance formation and the collaborative conditions present at the inception of the alliance influence the link between strategic alliances and firm value[7]. Figure 3.1 presents the model for the study.

[7] We limit our analysis to those variables for which there is sufficient cumulative evidence (five or more independent estimates) to warrant their inclusion in the meta-analysis.

FIGURE 3.1

Determinants of the Effects of Strategic Alliances on Firm Performance



Motives for Alliance Formation and Firm Value

Prior research suggests that firms may form alliances in response to perceived *interdependencies* with other organizations (Gulati, 1998). Important sources of interdependence, emphasized in the literature on the link between strategic alliances and firm value, are similarity and complementarity (a) in the geographic markets and (b) product domains in which firms operate and (c) in the assets they own. Salient among the inducements to form alliances are also the goal to exploit interdependencies in terms of (d) excess financial resources and of (e) those firm-specific resources that are valuable, rare, difficult to imitate, imperfectly tradable (e.g., Barney, 1991) and that, like public goods, can be shared or applied to new ventures at low marginal cost (Hennart, 1988).

***Geographic expansion*.** International expansion into new geographical markets is a pervasive motive underlying alliance formation. Indeed, between 1990 and 1999 international

alliances represented 46 percent of all alliance announcements involving at least one U.S. firm (Barfield and Thum, 2003). Prior research offers two contrasting perspectives on the type of international expansion that is pursued in strategic alliances and its effects on firm value. One perspective suggests that international expansion can create value through the diversification of risk, that is, the stabilization of a firm's rent stream by owning assets in multiple countries with unrelated economic cycles (e.g., Kim, Hwang, and Burgers, 1993). It predicts that international strategic alliances create more value when they are formed in host countries whose economies are less integrated with that of the home country, and whose capital markets are less developed thus creating barriers for individual investors to replicate the risk reduction through personal portfolio diversification (Lummer and McConnell, 1990).

In contrast, an alternative perspective suggests that entry into foreign markets is not motivated by risk reduction, but instead by the opportunity to exploit firm-specific assets across multiple locations in conditions where the marginal costs of such exploitation are low and the market for these assets is imperfect (e.g., Hennart, 1988). In this view, the effects of alliances on firm value are a function of the marginal costs of governing the cross-border exploitation of idiosyncratic assets. Transaction-cost theory suggests that the value creation effect of strategic alliances relative to other alternative modes of international expansion such as acquisitions and wholly-owned greenfields is highest when firms enter countries with diverse social cultures and economies (e.g., Hennart, 1988). This is because cooperation with local partners is particularly efficient when the firm does not possess all the knowledge required to operate in the host country, otherwise the firm would have entered using an international entry mode with a higher level of control. However, because the marginal costs of managing cooperation increase in tandem with cultural distance (e.g., Barkema, Bell, and Pennings, 1996) alliances may be most effective in moderately dissimilar, rather than highly dissimilar, host countries. Since low cultural distance is typically associated with high

economic integration, and vice-versa, (e.g., Slangen, Beugelsdijk, and Hennart, 2004), this perspective predicts that international strategic alliances create more value when they are formed in host countries with moderate levels of cultural distance and whose economies are moderately integrated with that of the home country (Dess et al., 1995).

Previous evidence on the linear relationship between the level of economic integration and cultural distance of the home and host countries and the performance effects of alliances has been mixed. Some studies have found a positive effect on firm value of alliances formed in uncorrelated economies (e.g., Ojah, Seitz, and Rawashdeh, 1997), while others have found a negative effect (e.g., Gupta and Misra, 2000). Similarly, whereas some studies have found a negative relationship between cultural distance and the value creation effects of alliances (e.g., Barkema and Piaskowska, 2003), others have found a positive effect (e.g., Kim and Park, 2004). We argue that risk diversification and asset exploitation may reflect complementary, rather than divergent, sources of value creation, and that economic integration may thus have a curvilinear relationship with firm value. Specifically, we predict that strategic alliances established in host countries whose economies are moderately integrated with that the partnering firms' home country are likely to generate the highest value for the alliance partners by producing both diversification and exploitation benefits.

> *Hypothesis 1a-b. The relationship between the level of (a) economic integration between the home and host countries and (b) cultural distance and the effects of strategic alliance announcements on firm value is curvilinear (inverted U-shape).*

Product-market expansion. Firms may establish alliances that expand across product-market boundaries to benefit from the risk reduction and economies of scale or scope associated with leveraging firm-specific assets across a variety of product markets. Prior research suggests that the effects of such alliances on firm value are contingent on the degree of *alliance product-market relatedness*, that is the level of resource or product-market

similarity between the parent firm and the alliance (e.g., Koh and Venkatraman, 1991). This is because the benefits and costs of product-market expansion may differ across different levels of alliance relatedness. Alliances formed in highly related markets may generate gains to the parent firm by creating opportunities for the firm to exploit in the alliance its firm-specific assets and capabilities which tend to be industry-specific, increasing market power, and creating barriers to entry (Hennart, 1988; Pfeffer and Nowak, 1976, Porter and Fuller, 1986). In addition, since absorptive capacity is higher for proximate domains of activity (Cohen and Levinthal, 1990), related alliances create more opportunities for learning through knowledge transfer between the parent and the alliance (Inkpen, 2000). Conversely, alliances formed in unrelated markets may create financial benefits in terms of risk diversification and increased debt capacity, but may also lead to higher management costs as a result of managing increasingly diverse businesses (Palich, Cardinal, and Miller, 2000). Moreover, a transaction-cost perspective suggests that alliances are superior to other modes of corporate development when firms exploit their firm-specific assets in unrelated market domains for which they do not possess all the required assets and capabilities to compete successfully (Hennart, 1988).

There has been no theoretical and empirical consensus on whether alliances that operate in product-market domains which are related to those of the parent (the level of alliance product-market relatedness) are likely to have a positive or negative impact on firm value. While some studies have predicted and found a positive effect of alliance relatedness on firm value (e.g., Merchant, 2002), others have suggested and found a negative effect (e.g., Ferris, Sen, Lim, and Yeo, 2002). We argue that strategic alliances established in moderately related product-market domains will create more value than those established in highly related or highly unrelated markets. When expanding into highly related markets, firms generally possess all necessary resources to effectively enter the market. Accordingly,

internal development is generally a more efficient mode of corporate development for expanding into these markets and the relative value effects of strategic alliances will be lower (Chatterjee and Singh, 1999). In addition, expansion into related markets does not create diversification benefits for the partnering firms. In contrast, when expanding into highly unrelated markets, the partnering firm is likely to have fewer opportunities to create value by exploiting its existing assets. Moreover, the costs of managing a highly diverse business are also likely to increase significantly, limiting the potential for value creation. Alliances established in moderately related markets allow firms to exploit their idiosyncratic assets, while simultaneously acquiring new knowledge and deriving some benefits from diversification. Hence, we predict:

Hypothesis 2. The relationship between alliance product-market relatedness and the performance effects of strategic alliance announcements is curvilinear (inverted U-shape).

Exploit resource interdependence. Strategic alliances are mechanisms for governing interdependence between firms, in terms of their assets, capabilities or activities (Gulati, 1998). Prior research on strategic alliances (Hennart, 1988) suggests that firms can derive economic benefits from two types of resource interdependence: gains from pooling similar resources, and gains from pooling distinct, but complementary, resources. Resource and product-market similarity (relatedness) between alliance partners may facilitate communication, knowledge transfer and coordination, decrease transaction costs, and create the opportunity to achieve economies of scale in administration, production, marketing and R&D (Koh and Venkatraman, 1991; Merchant and Schendel, 2000). In contrast, resource and product-market complementarity (unrelatedness) between alliance partners may create opportunities for achieving economies of scope from combining products, knowledge, and market presence that complement and enhance one another so that their joint value is greater

than their separate value (e.g., Hennart, 1988). Empirical evidence on the effects of partner relatedness on the link between strategic alliances and firm value has been mixed, with some studies finding a positive relationship (e.g., Chan, Kensinger, Keown, and Martin, 1997) and others a negative one (e.g., Chang and Chen, 2002). Because both relatedness (similarity) and unrelatedness (complementarity) between the alliance partners can create value, we predict:

Hypothesis 3a. The degree of partner relatedness will have no effect on the link between strategic alliance announcements and firm value.

Strategic alliances are generally formed to govern resource interdependence between the partnering firms in three distinct functional domains: marketing, production, or research and development. Prior research suggests that the effects of alliances on firm value may vary between these different domains of interdependence, with R&D alliances creating more long-term value than production or marketing alliances (Chan et al., 1997; Das, Sen, and Sengupta, 1998). Das, Sen, and Sengupta (1998) suggest that this is because R&D alliances are typically associated with the combination of firm-specific, often tacit, knowledge and the development of new resources, products, and capabilities which are likely to generate new sources of rents and growth opportunities for the participating firms and that, as a result, have a long-term impact on performance. In contrast, product and marketing alliances are associated with the exploitation, rather than the exploration, of existing assets and capabilities and are therefore less likely to generate growth options that have a positive impact on long-term firm performance. However, although R&D alliances may generate more value by increasing a firm's portfolio of resources as well as creating new strategic options, their outcomes are considerably more uncertain that those of production or marketing alliances which leverage existing assets. Thus, given the higher certainty associated with we the impact of production and marketing alliances we predict that they should, on average, create more firm value. Thus, we propose:

Hypothesis 3b. The effects of marketing and production alliance announcements on firm value are greater than those of R&D alliances.

Exploit competitive interdependence. In addition to resource interdependence, alliance formation may also exploit competitive interdependence between the participating firms to obtain gains from collusion (Kogut, 1988; Pfeffer andNowak, 1976) by influencing the volume, price or attributes of products sold in an industry. Research suggests that the anti-competitive effects of strategic alliances, and hence their influence on firm performance, are likely to increase as a function of the level of industry concentration (e.g., Zantout, 1995). Thus, we predict:

Hypothesis 4. The concentration ratio of the alliance's industry has a positive effect on the impact of strategic alliance announcements on firm value.

Exploit firm-specific assets. Transaction-cost (e.g., Hennart, 1988) and resource-based (e.g., Penrose 1959) perspectives emphasize the exploitation of firm-specific assets as a primary motive underlying expansion decisions, especially for those assets that the firm owns in excess and that can be exploited at low marginal costs but, due to market imperfections, cannot be sold. By their nature, intangible assets such as reputation and know-how typically possess both characteristics (Lindenberg and Ross, 1981; Teece, 1980). Thus, the presence of intangible assets is likely to create opportunities for exploiting interdependencies between the partnering firms that derive economic value from economies of scope in the exploitation of intangible assets. Hence,

Hypothesis 5. The level of intangible assets of the partnering firms has a positive impact on the effects of strategic alliance announcements on firm value.

Exploit excess financial resources. Agency theory suggests that alliance formation may not always occur in response to opportunities to increase firm performance, but may sometimes be motivated by managerial self-interest (Jensen, 1986). Specifically, by forming

strategic alliances to increase firm size and reduce risk through diversification managers may increase their power and compensation as well as reduce their employment risk (Wild, 1994) irrespective of the strategic alliance's economic effects. Prior research suggests that the availability and sources of firms' financial resources influences managerial discretion, with discretion increasing when investments are financed with free cash flow (cash flow exceeding that required to fund all current positive net value investments), and decreasing when they are funded through external financing (Jensen, 1986; Smith and Watts, 1992; Williamson, 1988). Bourgeois (1981) has suggested that the relationship between financial resources and firm performance may be curvilinear. This is because, although possessing excess financial resources may have deleterious effects, having access to a critical level of financial resources may also allow firms to respond quickly to strategic opportunities and temporarily buffer firms from external threats. Consistent with this view we propose that moderate levels of free cash-flow will increase the impact of strategic alliances on firm value by allowing firms to react efficiently to potential interdependencies with other firms, while simultaneously limiting managerial discretion. In addition, because external financing, measured by the firms' financial leverage (the ratio of long-term debt to market value), is constrained by loan covenants we expect that external financing will provide the required resources to finance the development of strategic alliances, while simultaneously limiting managerial discretion. Thus, we predict:

> *Hypotheses 6a. The relationship between a firm's level of free cash flow and the effects of strategic alliance announcements on firm value is curvilinear (inverted U-shape).*
>
> *Hypothesis 6b. The level of financial leverage of the partnering firms has a positive impact on the effects of strategic alliance announcements on firm value.*

Collaborative Conditions and Firm Value

Strategic alliances differ considerably, not only in the motives underlying alliance formation and the type of interorganizational interdependencies that they exploit but, importantly, in the capabilities and resources of the partnering firms, and the structural attributes of the alliances themselves. Prior research suggests that these collaborative conditions may have an important bearing on the extent to which the potential for value creation arising from the exploitation of interdependencies is fully realized (e.g., Merchant and Schendel 2000). In the present research we explore two types of collaborative conditions that may shape the degree of cooperation between the two partners and the ability to generate relational rents. These include the governance and relational structure of the alliance and the learning processes that take place at the level of the partnering firms (see Figure 3.1).

Governance structure of the alliance. Coordinating, exchanging, and combining assets, knowledge, and activities in strategic alliances, although potentially valuable, can also entail substantial costs and risks for the firms entering them. These risks, which can increase transaction costs and reduce cooperation between the alliance partners, may arise as a result of asymmetrical dependence between the partnering firms, difficulty in monitoring each partner's assets and contribution, and appropriation concerns regarding unwanted spillovers of firm-specific assets and knowledge to the alliance partners (Hennart, 1988). Transaction cost theory (Hennart, 1988; Williamson, 1985) suggests that the incidence of these hazards is contingent on the contractual structure governing the alliance. In other words, it postulates that firms can minimize the potential hazards from cooperation and the accompanying transaction costs by choosing a governance structure for the alliance that maximizes the partners' joint incentive to cooperate and minimizes their incentives to behave opportunistically. Thus, the extent to which the governance structure chosen for the alliance offsets the potential risks inherent to collaboration is likely to determine the degree of

cooperation between the alliance partners and the economic value they derive from the alliance. Specifically, research has shown that hierarchy-based organizational mechanisms (equity alliances) become more effective than market-based organizational mechanisms (non-equity alliances) as appropriation concerns and opportunism increase (e.g., Hennart, 1991). Given that appropriation concerns and risks of opportunism are particularly high for intangible assets and idiosyncratic knowledge (Hennart, 1988), we predict:

Hypothesis 7a-b. The effects of the announcement of (a) R&D alliances and (b) alliances that exploit the intangible assets of the partnering firms on firm value are higher for equity alliances than for non-equity alliances.

However, a transaction cost perspective also postulates that firms typically select the optimal governance mode given the characteristics of the alliance and that, as a result, mode choice should, on average, have no effect on firm performance (McGahan and Villalonga, 2003). Hence,

Hypothesis 7c. The governance structure of a strategic alliance (equity vs. non-equity) has no effect on firm value.

While all equity alliances share a common incentive structure that differs fundamentally from non-equity alliances, there is substantial heterogeneity in how equity ownership is distributed between the partner firms. Prior research suggests that the performance benefits a firm derives from alliance formation, may be contingent on its ownership share of the alliance (e.g., Merchant and Schendel, 2000). In particular, a parent firm's ownership share in the alliance influences its incentives and power to control the alliance's strategy and activities, with majority equity ownership guaranteeing that the interests of the majority parent will be served by the equity alliance (e.g., Merchant and Schendel, 2000; Park and Kim, 1997). However, while the majority partner has both a higher incentive and greater power to influence the strategy of the equity alliance, the minority

partner will also have lower incentives to cooperate (e.g., Hennart, 1988). Hence the majority partner will have to invest more resources in monitoring the minority partner because the majority partner will suffer more if the venture goes badly. For the majority partner, the higher potential gains are therefore balanced by the higher potential costs it will shoulder should the minority partner shirk. Hence, we predict:

Hypothesis 7d. A partnering firm's level of equity ownership in a strategic alliance has no effect on firm value.

Relational structure of the alliance. The cooperative behavior of the alliance partners is shaped not only by the governance structure of the alliance but also by its relational structure (e.g., Gulati, 1995). Indeed, prior research has shown that the degree of similarity in the dominant logics of the partnering firms (Bettis and Prahalad, 1995) and in the norms and routines regulating partners' cooperative behavior can have an important influence on the impact of alliances on firm value (e.g., Merchant and Schendel, 2000; Park and Kim, 1997). This is because similarity between the organizational goals and structures of the alliance partners is likely to be associated with compatible dominant logics and this will, in turn, facilitate the development of more efficient coordination and communication processes in the alliance (e.g., Lyles and Salk, 1996). Our review indicates that extant research has mostly examined two elements of the relational structure: whether the alliance is established with a foreign for-profit firm or instead with a foreign state-owned enterprise and the history of prior ties between the alliance partners. Research has shown, for instance, that because state-owned enterprises often possess different goals and decision-making processes than private or public firms, a for-profit firm establishing an alliance with a state-owned enterprise may experience higher coordination costs and a lower impact of alliance formation on firm value (Lummer and McConnel, 1990). Hence, because prior research has focused on the impact of alliance announcements on the value of for-profit firms, we predict:

Hypothesis 8a. The effects of alliance announcements on firm value are higher for alliances between for-profit firms than for alliances between for-profit firms and state-owned enterprises.

In addition, Gulati and Wang (2003) have suggested that the repeated formation of alliances between partnering firms is generally associated with the presence of trust between them and leads to the development of interorganizational routines for joint decision-making and coordination which, in turn, may generate economic value by reducing transaction costs, facilitating monitoring, promoting learning and knowledge transfer, and reducing opportunism. Therefore, we hypothesize:

Hypotheses 8b. The larger the number of prior ties between the partners, the higher the positive impact of alliance announcements on firm value.

Organizational learning. Research on organizational learning has documented gains in performance stemming from accumulation of experience in performing an activity. This phenomenon has been observed in the context of learning by repetition in manufacturing (e.g., Yelle, 1979), and the development of organizational routines associated with the execution of complex organizational activities, such as the management of acquisitions (e.g., Haleblian and Finkelstein, 1999) and strategic alliances (Anand and Khanna, 2000). Thus, the accumulation of experience in forming and managing alliances should promote learning and the development of more effective routines for the formation and management of strategic alliances. However, research also suggests that persistent exploitation of an organizational routine may lead to the crystallization of knowledge in the form of a simplified, narrow and rigid knowledge base (Miller, 1993; Vermeulen and Barkema, 2001). This increasing simplification may, in turn, lead firms to inappropriately generalize their prior alliance experience to strategic alliances where this experience is not appropriate (cf. Haleblian and Finkelstein, 1999). This inability to adapt alliance management practices to the idiosyncratic

set of opportunities and threats related to forming or managing a particular alliance may have adverse effects on firm value. Hence,

Hypothesis 9a. The relationship between the alliance experience of the partnering firms and the effects of strategic alliance announcements on firm value is curvilinear (inverted U-shape).

Moreover, the development of alliance capabilities is likely to allow firms to manage more effectively the relational aspects of the alliance. Hence,

Hypothesis 9b-c. The partnering firms' level of alliance experience moderates the link between (b) cultural distance and (c) the type of alliance partner (for-profit firm vs. state-owned enterprise) on the effects of strategic alliance announcements on firm value.

Experience with a host country or geographic region has also been found to lead to the accumulation of knowledge and development of routines for interacting with the country's institutional and cultural environment (e.g., Barkema, Bell, and Pennings, 1996). However, because these attributes tend to be relatively stable over time, the crystallization of routines may not have negative performance effects. We therefore hypothesize:

Hypothesis 9d. The relationship between the country experience of the partnering firms and the effects of strategic alliance announcements on firm value is positive.

Research also suggests that the effects of learning on performance may differ across different types of alliances (Anand and Khanna, 2000). In a study of stock market reactions to strategic alliance announcements, Anand and Khanna (2000) proposed that the value of learning is contingent on the level of contractual ambiguity characteristic of a particular type of alliance, with experience being more valuable in ambiguous contexts. Consistent with their predictions, they found that in joint ventures, which are characterized by greater ambiguity, the accumulation of experience increased the partnering firms' ability to create value,

whereas in licensing, where the collaborative process is more codified, experience accumulation did not impact subsequent value creation. Building on this perspective, we argue that the effects of alliance experience and country experience may differ between equity and non-equity alliances. Specifically, we predict that experiential learning will be more valuable for the management of equity alliances that typically have a less defined contractual structure and instead rely on the ex post distribution of residual profits to promote cooperation, than for non-equity alliances that are generally characterized by more codified and detailed contractual stipulations

Moreover, since forming an international joint venture involves the establishment of a new firm and requires a high level of interaction with the host country's political and legal environment, the value of country experience should be higher for equity than non-equity international alliances. Thus, we predict:

> *Hypothesis 9e-f. The value creation effects of (e) alliance experience and (f) country experience are higher for announcements of equity than for those of non-equity alliances.*

METHODS

We conducted two distinct, but complementary, meta-analyses. The first meta-analysis explores the effects of alliance announcements on firm value. The second meta-analysis cumulates the empirical evidence on the factors that influence the impact of strategic alliances on firm value. Together, they allow us to establish firm generalizations on whether and when firms benefit from entering strategic alliances. The two meta-analyses were conducted according to the guidelines provided by Hegdes and Olkin (1985).

Sample

We combined multiple data collection strategies to identify published and unpublished empirical studies that provided estimates of the impact of strategic alliances on

firm value. We limited our search to studies that employed the event study method, since this has been the prevalent methodology to estimate the effects of individual alliances on firm value (Gulati, 1998). In event studies, the financial effects of a corporate event on firm value, termed abnormal returns, are measured as the difference between the observed event-day returns on a security and the estimated returns that would be expected in the absence of the event. Prior research on strategic alliances has provided support for the predictive validity of abnormal returns as indicators of the impact of strategic alliances on firm performance. For instance, Koh and Venkatraman (1991) and Kale, Dyer, and Singh (2002) have found that managers' evaluation of the performance effects of strategic alliances in the years following alliance formation was significantly correlated with the abnormal returns estimated at the time of the alliance announcement.

First, articles were identified through a bibliographic search of computerized databases. ABI/Inform Global, EconLit, JSTOR, Kluwer Online, Elsevier Science Direct, and the Social Science Citation Index were searched using the terms 'joint venture(s)', 'strategic alliance(s)', 'performance', 'event study', 'shareholder value', 'abnormal return(s)', 'wealth effect(s)', 'residual(s)', 'prediction error', 'excess return(s)', and 'firm value'. Second, we performed manual searches (over the 1980 to 2004 period) of relevant journals in finance, accounting, management, and marketing, including: *Academy of Management Journal, Journal of Accounting Research, Journal of Finance, Journal of Financial Economics, Journal of International Business Studies, Journal of Management, Journal of Marketing, Journal of Marketing Research,* and *Strategic Management Journal*. Third, we performed Internet searches using standard search engines. Finally, we examined the reference sections of all the articles retrieved and of prior narrative reviews of the strategic alliance literature (e.g., Gulati, 1998).

Studies were considered eligible for the meta-analysis if they reported on the effects

of strategic alliance announcements on firm value, measured in abnormal returns. In addition, to be included in our database, the study had to be based on daily returns. This search process yielded 110 empirical studies (including 30 unpublished papers) from which we obtained 554 estimates of the impact of strategic alliances announcements on firm value and 296 estimates (bivariate correlations) of the effects of factors associated with the motives for alliance formation and the collaborative conditions present at the inception of the alliance on the link between alliance formation and firm value. Because some studies provided information on more than one independent sample, our analysis is based on 140 independent samples with a total sample size of 32,596 strategic alliances announced between 1963 and 2001. Two judges independently coded each study. The overall level of interrater reliability for coding decisions was 97%. Inconsistencies were resolved through discussion.

Meta-Analytic Procedures

Effects of strategic alliances on firm value. For the meta-analysis of the effects of alliance announcements on firm value two judges independently coded for each study the sample size and the reported abnormal returns for the partnering firms over eight distinct event windows ranging from the day of the strategic alliance announcement (day 0) to a 21-day window surrounding the announcement day. We also coded potential substantive and methodological moderators, including the strategic alliance characteristics and the length of the event window used to estimate the abnormal returns associated with strategic alliance announcements. The variables characterizing the strategic alliances were the (a) mode of governance: equity vs. non-equity alliances; the (b) industry sector: the percentage of strategic alliances in manufacturing industries (cf. Huber, Miller, and Glick, 1990); the (c) geographic scope of the strategic alliances: national origin of the partnering firms and whether the alliance is domestic or international (domestic alliances formed between U.S. firms; international alliances involving at least one U.S. firm; domestic alliances formed

between firms located outside the U.S.; international alliances involving at least one non-U.S. firm); and (d) the mean year of alliance formation. Finally, we test for the presence of publication bias by coding the publication status of the study (published vs. unpublished). Publication bias is present if the probability that a study is published is contingent on the magnitude, direction or significance of its results (Begg, 1994).

To investigate the influence of strategic alliance characteristics and the length of the event window on the magnitude of estimated abnormal returns, we separately modeled the abnormal returns obtained for event window l in study k (AR_{lk}) as a function of a alliance characteristics, denoted as $X_{j,lk}$ (Hedges and Olkin, 1985). In order to obtain accurate estimates of the effects of alliance characteristics on firm value, we need to account for within-study dependency between the abnormal returns estimated for different event windows. Hierarchical linear models, also termed multilevel models, provide a statistical method for directly modeling the dependency between multiple estimates of abnormal returns obtained from the same study (Raudenbush and Bryk, 2002). Hierarchical linear models are random-coefficient regression models for analyzing nested data structures such as the presence of multiple event windows within the same study. In addition, because effect sizes based on larger samples contain less sampling error, we use the sample size as a weight in our analysis (Hedges and Olkin, 1985). In particular, we estimated the following weighted hierarchical linear model (Bijmolt and Pieters, 2001):

$$AR_{lk} = \beta_0 + \sum_{j=1}^{J} \beta_j X_{j,lk} + e_{lk} + u_k \qquad (2)$$

where we assume that the within-study error components e_{lk}, and the between-study error components u_k are normally distributed with zero mean and variances ς^2 and τ^2, respectively. Prior to estimating the hierarchical linear model we examined potential collinearity between the measures capturing the strategic alliance characteristics and the length of the event window. Examination of variance inflation factor (VIF) statistics

indicated a low level of collinearity with no important effects for model estimation (maximum VIF = 3.22). This result suggests that there is little co-variation among distinct alliance characteristics, indicating that the meta-analysis encompasses a wide range of strategic alliances and research settings.

Determinants of the effects of alliances on firm value. For the meta-analysis examining the determinants of the link between strategic alliances and firm value, we coded the sample size and the correlations between the predictor variables and the impact of alliance announcements on firm value measured in abnormal returns. The construct operationalizations reported in the original studies were used to classify all correlations. All relationships in this analysis include data from at least five independent samples (mean = 12 samples), with an average sample size per relationship of 2,418 strategic alliances (range = 1,020–5,749). For studies that did not provide correlations, reported statistics (Student's t, univariate F ratios, exact p-values) were converted to correlation coefficients by means of formulas provided by Rosenthal (1994). For each correlation, we used the sample-adjusted meta-analytic deviancy statistic developed by Huffcutt and Arthur (1995) to identify the presence of outlying observations. No outliers were identified. Correlations were individually corrected for artificial dichotomization of continuous independent variables and for range restriction in independent dichotomous variables (Hunter and Schmidt, 1990). This is because the dichotomization of variables that represent underlying continuous constructs artificially reduces the magnitude of the observed correlation by approximately 20 percent (Cohen, 1983). Given that for the same determinant of the link between strategic alliances and firm performance, studies varied in the extent to which continuous variables were or not dichotomized, these corrections are required to make effect sizes comparable across studies.

Following the meta-analytic procedures described by Hedges and Olkin (1985), we computed a pooled correlation coefficient for each determinant of the effect of strategic

alliances on firm performance. Specifically, we (1) transformed each observed correlation to Fisher's *Z* in order to avoid the slight bias associated with averaging correlations, (2) weighted the observed *Z*-values by the sample size of the study, and (3) computed the mean weighted correlation by back-transforming the average *Z*-value into a correlation coefficient. We also estimated 95 percent confidence intervals around the mean weighted correlations and conducted homogeneity analyses based on the *Q* statistic (Hedges and Olkin, 1985) to evaluate the extent to which the estimated correlations were drawn from the same population.

Curvilinear relationships imply that the magnitude and/or direction of the correlation between an independent variable and the impact of alliances on firm value is contingent on the value of the independent variable. Therefore, to test the hypothesized curvilinear relationships the mean values of the independent variable for each study were used as predictors in weighted regression analyses in which sample size was used as a weight (Hedges and Olkin, 1985). For instance, to test whether the relationship between a firm's alliance experience and the performance effects of alliances was curvilinear, we regressed the correlation between alliance experience and firm performance onto the mean value of alliance experience for each study and its quadratic term. To test the predicted curvilinear effects we coded for each relevant study the mean values of: (a) alliance experience, (b) partner relatedness; (c) alliance relatedness; (d) the host country's level of economic development; (e) the host country's level of capital market development; and (f) the level of free cash flow of the partnering firms.

RESULTS

Do Firms Benefit from Entering Strategic Alliances?

Table 3.1 provides meta-analytic results of the effects of strategic alliances on firm value based on 110 empirical studies and reflecting a total sample size of 32,596 strategic alliances. We first estimated a random-effects model that includes only an intercept term

(Model 1). This model provides a baseline against which to compare more complex models. Our findings indicate that the variance at the within-study level is 39.20 and that at the between study-level is 1.28. This corresponds to an intra-study correlation of 0.97, indicating that, as expected, abnormal returns obtained from the same study are highly correlated and, therefore, that a hierarchical linear model should be estimated to account for this dependency.

In Model 2 we examine the impact of strategic alliances on firm value for different event windows of varying length. The results show that strategic alliances have, on average, a positive effect on firm value. For instance, at the time the alliance is announced (day 0) the meta-analytic estimate of the mean abnormal return for the participating firms is 0.46 percent. This means that by announcing a strategic alliance the stock market capitalization of a firm increases by 0.46 percent. Significantly, the performance effects of strategic alliances are not only positive, but they are also considerably larger than the gains obtained by bidders in merger and acquisitions. In a meta-analysis of the factors influencing value creation in mergers and acquisitions, Datta, Pinches and Narayanan (1992) found that abnormal returns over a 21-day window were 0.39 percent for bidders. In contrast, our findings show that, over an equivalent 21-day window, the abnormal returns for firms participating in strategic alliances are 1.11 percent, (obtained by summing the event-day abnormal return of 0.46 percent with the 0.65 increase in abnormal returns associated with a 21-day event window).

Model 3 shows the impact of strategic alliance characteristics on the link between alliance announcements and firm value. To evaluate model fit we compare the deviance of the full model (-2 times the log-likelihood) with the deviance of a baseline, random-effects, model that includes only an intercept term (Model 1). The deviance statistics of the full model (1309.3) compares favorably with the baseline random-effects model (1231.7) indicating an increase in model fit ($\chi^2(17) = 77.6$, $p < 0.001$).

Following transaction cost theory, Hypothesis 7c predicts that, on average, the

governance structure of the alliance (equity vs. non-equity) has no effect on its performance and hence on firm value. This is because firms are expected to choose whatever governance structure is optimal. Consistent with this prediction, our results indicate that announcements of equity alliances have the same impact on firm value than those of non equity alliances (B = -.30, $p > .20$). Thus, Hypothesis 7c cannot be rejected.

TABLE 3.1

Results Weighted of Hierarchical Linear Regression for Abnormal Returns[a]

	Model		
Variables	**1**	**2**	**3**
Geographic Scope[b]			
U.S.–International			-.09[c]
Non-U.S.–Domestic			-.82 [c,d]
Non-U.S.–International			-.72 *** [d]
Equity Alliances			-.30
Alliances in Manufacturing			-.44
Year of data collection			
1980-1984			-.08
1985-1989			.21
1990-1994			.33
1995-2000			.70
Event Window			
(-1,0)		.27***	.27***
(0,1)		.22***	.22***
(-1,1)		.45***	.45***
(-2,2)		.46***	.46***
(-3,3)		.52***	.54***
(-5,5)		.51***	.51***
(-10,10)		.65***	.65***
Published			-.31
Intercept	.80***	.46***	1.07**
-2 log likelihood	1309.3***	1255.2***	1231.7***
Within-study variance	39.20***	32.40***	30.48***
Between-study variance	1.28***	1.39***	1.46***

[a] $n = 554$. Cell entries are unstandardized coefficient estimates.
[b] *U.S.–Domestic*: all alliance partners are U.S firms; *U.S.–International*: alliances involving at least one U.S. firm and a non-U.S. partner; *Non-U.S.–Domestic*: all alliance partners are non-U.S. firms from the same nationality; *Non-U.S.–International*: alliance partners are non-U.S. firms from different nationalities.
[c,d] Values sharing a superscript are not significantly different at the 5 percent level.
* $p < .10$
** $p < .05$
*** $p < .01$

Model 3 also tests the effect of additional alliance characteristics on their impact on firm value, including the country where the partnering firm is listed, time of formation, and industry of the strategic alliance. First, our results show that the country where the partnering firm is listed (U.S. vs. non-U.S. stock markets) influences its effects on firm value. In particular, statistical tests of equality between the regression coefficients (Verbeek, 2000) show that international alliances formed by non-U.S. firms create less value for the partnering firms in their home (non-U.S.) stock markets, than the value created in the U.S. stock market by international (B = -.63, p < .001) and domestic (B = -.72, p < .01) alliances formed by U.S. firms. This finding may reflect national differences in stock market reactions to strategic alliances, systematic differences in the type of strategic alliances formed by non-U.S. firms relative to U.S. firms, or the greater efficiency of US firms in managing alliances. Second, our findings indicate that estimated abnormal returns tend to be consistent across different time periods, suggesting that the response of market participants to strategic alliance announcements has been relatively stable over time, and that it has been fairly independent of overall market and economic conditions. Third, we find that the industry composition of the sample has no significant effect on estimated abnormal returns (B = -.44, p > .25). This indicates that the performance effects of alliances are fairly stable across manufacturing and non-manufacturing industries. Finally, we examined the presence of a publication bias by investigating whether there are systematic differences in abnormal returns between published and unpublished studies. Our results show that this is not the case (B = -.31, p > .20), suggesting absence of a publication bias.

Determinants of the Alliance-Firm Value Link

In this section, we report the meta-analytic results for 14 determinants of the link between strategic alliances and firm value. These results are estimated on the basis of 83 independent samples from 78 articles examining the impact of 15,439 strategic alliances on

firm value. Table 3.2 reports, for each determinant, the sample-size weighted mean correlation coefficient (ρ), the total sample size for each correlation (N), the number of correlations from independent samples (k), the 95 percent confidence interval around each correlation mean (CIρ 5%, CIρ 95%), and the test of homogeneity in effect sizes which indicates the presence of moderating variables (Q). Correlations are concluded to be significant when the 95% confidence interval does not contain zero. Table 3.3 reports the results of the moderator analyses. For each moderator analysis of a determinant of the link between strategic alliances and firm value, Table 3.3 reports the standardized regression coefficients and R^2 of the weighted regression analyses, a test of the heterogeneity that remains after controlling for the hypothesized moderators (Q residual), the total sample size for each correlation (N), and the number of correlations from independent samples used in the moderator analyses (k). Table 3.3 also reports results for the hypothesized curvilinear relationships where each correlation is regressed on a linear and on a quadratic term of the mean value of the predictor variable for each study.

Motives for alliance formation and firm performance. Table 3.2 provides the results of separate meta-analyses of the impact of distinct motives for alliance formation on firm performance. Hypothesis 1a predicted that the level of economic integration between the economies of the home country of the partnering firms and the alliance's host country had an inverted U-shaped relationship with firm performance. Prior research has employed two distinct operationalizations of economic integration: the level of economic development of the host country and the level of development of the host country's capital market. Because all studies included in the meta-analysis of the impact of economic integration on the effects of strategic alliances on firm value examined firms from developed countries, higher levels of economic development of the host country are indicative of higher levels of economic integration.

TABLE 3.2

Meta-Analytic Results for the Determinants of the Effects of Strategic Alliances on Firm Value[a]

Variables	*k*	*N*	*ρ*	CI*ρ* 5%	CI*ρ* 95%	Q
Motives for Alliance Formation						
Level of economic integration	19	3,325	.041*	-.001	.082	47.202***
Alliance relatedness	13	2,518	.121***	.076	.164	43.214***
Partner relatedness	17	3,524	.021	-.021	.064	45.017***
R&D alliances	19	4,007	.074***	.036	.111	69.429***
Industry concentration	5	1,020	.058*	-.008	.124	17.424***
Intangible assets	21	3,202	.154***	.116	.192	57.280***
Free Cash Flow	13	2,221	-.032	-.077	.013	37.277***
Financial leverage	13	1,635	-.026	-.076	.024	51.086***
Collaborative Conditions						
Equity share in the alliance	9	1,186	.065**	.001	.127	16.093**
Cultural distance	6	1,142	.020	-.038	.078	10.356*
Alliance with foreign state-owned firm	5	1,203	-.102**	-.182	-.020	4.304
Prior ties	7	1,581	.057*	-.002	.116	6.530
Alliance experience	17	5,749	.004	-.023	.031	41.653***
Country experience	11	1,542	.088***	.025	.150	33.279***

[a] *k* = number of correlations from independent studies; *N* = total sample size; *ρ* = estimate of population correlation; CI*ρ* 5% = lower bound of the 95% confidence interval for *ρ*; CI*ρ* 95% = upper bound of the 95% confidence interval for *ρ*; Q = chi-square test for heterogeneity.

* $p < .10$

** $p < .05$

*** $p < .01$

TABLE 3.3

Results of Weighted Regression Analyses for the Determinants of the Effects of Strategic Alliances on Firm Value[a]

Variables	Equity alliance	International alliance	Manufacturing	Alliance experience	Linear Term	Quadratic Term	R2	Q residual	N	*k*
				Motives for Alliance Formation						
Level of economic integration					-.58***	-.43***	.36***	18.63	3,325	19
Alliance relatedness					-.45**	-.62***	.23***	33.40***	2,518	13
Partner relatedness	-.33*	-.75***	.31*				.34***	29.50***	3,524	17
R&D alliances	.39***						.15***	60.15***	4,007	19
Industry concentration			-.70***				.49***	8.24**	1,020	5
Intangible assets	-.07						.01	48.30***	3,202	21
Free cash flow					.22	.22	.45***	20.61**	2,221	13
Financial leverage	.39***	-.13	.67***				.33***	34.46***	1,635	13
				Collaborative Conditions						
Equity share in the alliance		-.51*	-.10				.32**	10.93*	1,186	9
Cultural distance				-.73**	-.64	.10	.79**	2.12	1,142	6
Alliance experience	.32**				-.71	1.07**	.42***	24.33**	5,749	17
Country experience	.54***						.29***	23.73***	1,501	11

[a] All predictor variables are mean-centered. Cell entries are standardized coefficient estimates. *Linear term* = linear component of the relationship between the mean level of the predictor variable and the correlation between the predictor variable and the performance effects of strategic alliances; *Quadratic term* = quadratic component of the relationship between the mean level of the predictor variable and the correlation between the predictor variable and the performance effects of strategic alliances; *k* = number of correlations from independent studies; *N* = total sample size; *Q residual* = chi-square test for heterogeneity for regression residuals.

* $p < .10$

** $p < .05$

** $p < .01$

To test whether the type of measure of economic integration used influenced the results we classified the studies according to how economic integration was operationalized. Results from a weighted regression analysis show that the magnitude of the effects did not depend on the type of measure used (β = .17, n.s.).

Table 3.2 shows that the level of economic integration between the home and host countries has a small, marginally significant impact on the consequences of strategic alliances for firm value (ρ = .04, p < .06). The significant Q-statistic indicates the presence of moderators. Consistent with hypothesis 1a, results from Table 3.3 show that the host country's level of economic integration with the home country of the partnering firm has an inverted U-shaped impact on the effects of strategic alliances on firm value ($\beta_{Economic\ development\ squared}$ = -.43, p < .01). Thus, international strategic alliances create more value when they are established in a country that is moderately integrated with the home country of the partnering firm.

According to Hypothesis 1b, the level of cultural distance between the partnering firms also has a curvilinear effect (inverted U-shape) on the alliance-firm value link. The results reported in Table 3.3 provide no support for the hypothesized relationship ($\beta_{Cultural\ distance\ squared}$ = .10, n.s.). The results of Table 3.2 also show no evidence of a significant effect of cultural distance on the impact of strategic alliances on firm value (ρ = .02, n.s.), but suggest instead that this relationship is heterogeneous. Below we investigate the hypothesized role of alliance experience as a potential moderator of this effect.

Hypothesis 2 proposes an inverted U-shaped relationship between the extent to which the alliance operates in a product-market domain which is related to that of the parent firm (alliance product-market relatedness) and firm value. Lending support for Hypothesis 2, the results of Tables 3.2 and 3.3 show that, although alliance relatedness has a linear positive effect on firm performance (ρ = .12, p < .01) this effect is not homogeneous but follows,

instead an inverted U-shaped curve ($\beta_{Alliance\ relatedness\ squared}$ = -.62, p < .01).

Hypotheses 3a and 3b focus on the impact of resource interdependence on the link between alliances and firm value. Our findings, reported in Table 3.2, show that the extent to which the partners are active in similar industries (partner relatedness) has no significant effect on the impact of strategic alliances on firm value (ρ = .02, n.s.). Thus, Hypothesis 3a cannot be rejected. This suggests that firms may derive value from combining similar or complementary resources with their partners. The Q-statistic indicates, however, that this effect is heterogeneous. We investigated potential sources of heterogeneity in this relationship by conducting a weighted regression analysis with the governance structure (equity vs. non-equity), geographic scope (domestic vs. international) and industry sector (manufacturing vs. non-manufacturing) of the alliance as moderators. We focused on these variables as they are available for all independent samples in our dataset and reflect important contingencies in the formation and management of strategic alliances (e.g. Erramilli, 1991; Hennart, 1988).

Our results, reported in Table 3.3, show that firms which are entering alliances with similar partners create less firm value if they enter international alliances than if they enter domestic alliances (β = -.75, p < .01). This result suggests that firms are less successful in combining similar resources and activities in international alliances than in domestic alliances and may be due to at least two factors. First, related partners are likely to have higher absorptive capacity than unrelated ones and may therefore use the alliance to appropriate knowledge from each other in order to exploit it outside the scope of alliance. Second, related partners also have more opportunities to free ride on each other's reputation or brand image. These potential hazards are likely to be more prevalent in international alliances because (a) monitoring costs are higher in these alliances and thus opportunism is more likely to remain unchecked; (b) intellectual property protection is likely to be weaker abroad than it is in the

US; (c) mechanisms for effective retaliation against opportunistic behavior may be less efficient in international alliances relative to domestic alliances as a result of cultural distance, geographic distance and institutional differences between the home and host countries.

Contrary to Hypothesis 3b we found that R&D alliances create more value than production and marketing alliances (ρ = .07, p < .01), but that this effect is heterogeneous. This suggests that shareholders value more positively the uncertain gains from developing new sources of value creation than the exploitation of existing resources. Results from Table 3.3 show that this heterogeneity is moderated by the governance structure (equity vs. non-equity) of the strategic alliance (β = .39, p < .01) with equity R&D alliances creating more value than non-equity R&D alliances. Hence Hypothesis 7a is supported.

According to Hypothesis 4 strategic alliances formed in highly concentrated industries allow partnering firms to create value by increasing their market power. This hypothesis was only marginally supported (ρ = .06, p < .09), with the Q-statistic indicating significant heterogeneity in this effect. To account for this heterogeneity, we tested whether the effect of industry concentration varies as a function of the industry sector in which the alliances were formed. Results from Table 3.3 suggest that is does, with alliance formation in concentrated manufacturing industries creating significantly less value than alliance formation in concentrated non-manufacturing industries (β = -.70, p < .01).

Hypothesis 5 suggests that ownership of intangible assets provides opportunities for the partnering firms to create value in strategic alliances. Hypothesis 7b predicts that this effect will be contingent on the governance structure of the alliance, with equity alliances providing more effective mechanisms for minimizing opportunism. Consistent with Hypothesis 5 but not with Hypothesis 7b, results from Tables 3.2 and 3.3 show that the level of intangible assets owned by the partnering firms has a positive effect on the impact of

alliances on firm value (ρ = .15, p < .01), and that this effect is not influenced by the governance structure of the alliance (β = -.07, n.s.).

Hypothesis 6a predicts a curvilinear relationship between the partnering firm's level of free cash flow and the effects of strategic alliances on firm value. Hypothesis 6b proposes a positive linear relationship between financial leverage and the alliance-firm value link. Results from Table 3.3 show that neither a firm's level of free cash flow nor its financial leverage affect how much it will gain value following the announcement of an alliance (ρ = -.03, p > .15 and ρ = -.03, p > .30, respectively). Instead, our findings indicate that these effects are heterogeneous. Contrary to the curvilinear relationship proposed in Hypotheses 6a, we found no evidence for such an effect on the relationship between the level of free cash flow and the impact of strategic alliances on firm value ($\beta_{Free\ cash\ flow\ squared}$ = .22, n.s.). We tested potential sources of heterogeneity in the impact of financial leverage on the link between alliance formation and firm value, by investigating the role of governance structure, geographic scope, and industry sector of the alliance as moderators. Results from Table 3.3 show that the effects of financial leverage are more positive for equity alliances (β = .39, p < .01) that are formed in manufacturing industries (β = .67, p < .01). This may perhaps reflect the fact equity alliances in manufacturing provide more tangible guarantees that the debt can be serviced than non-equity alliances in non-manufacturing industries which are generally associated with less formalized agreements and less tangible assets.

Collaborative conditions and firm performance. Having examined the differential impact of distinct motives for alliance formation on the link between strategic alliances and firm performance and identified some moderators of these effects, we now analyze the impact of the collaborative conditions of the alliance on firm value.

According to Hypothesis 7d, the partnering firm's share in the ownership of equity alliances has no significant effect on the impact of strategic alliances on firm value. The

findings of Table 3.2 provide no support for this hypothesis. Instead, the meta-analytic evidence shows that a firm's share in equity alliances has a positive effect on its ability to appropriate value from the strategic alliance (ρ = .07, p < .05) but also that this effect is heterogeneous. We investigated potential sources of heterogeneity in this relationship by conducting weighted regression analyses with geographic scope and industry sector of the alliance as moderators. The results in Table 3.3 show that owning a large equity share in international alliances has a marginally significant negative effect on firm value (β = -.51, p < .07). This finding appears to support the notion that leaving local partners with a high share of the alliance assures that they will provide the all-important knowledge and support needed to operate in foreign countries (e.g., Beamish, 1984).

Hypotheses 8a and 8b suggest that whether the partner is a for-profit firm or a state-owned company and the history of prior direct ties between the alliance partners shape the relational structure of the alliance and influence its effects on firm performance. Our results provide support for the predicted negative effects on firm value of for-profit firms forming alliances with a foreign state-owned company (ρ = .10, p < .05). The effect of the existence of prior ties between the partnering firms is small and only marginally significant (ρ = .06, p < .06). In other words, the prior history of cooperation between the partnering firms has very limited impact on the effect of subsequent alliances on firm value.

Hypotheses 9a-f focus on the impact of alliance and country experience on the performance effects of strategic alliances. Contrary to Hypothesis 9a, results reported in Table 3.3 show a U-shaped relationship, instead of the predicted inverted U-shaped link, between alliance experience and the economic impact of strategic alliances: the coefficient of the alliance experience/quadratic term is positive and significant at the 5% confidence level ($\beta_{Alliance\ experience\ squared}$ = 1.07, p < .05). This suggests that firms may inappropriately generalize from their experience when this experience is still limited rather than, as predicted, when this

experience is relatively extensive. Accordingly, our findings also suggest that persistent exploitation of a firm's alliance management knowledge and routines may not lead to the increasing crystallization of knowledge in the form of a simplified, narrow and rigid knowledge base (Vermeulen and Barkema, 2001), as hypothesized, but instead become progressively refined and responsive to the idiosyncrasies of each new venture. Moreover, contrary to Hypothesis 9b, we find that the effect of cultural distance becomes significantly more negative as firms accumulate alliance experience (β = -.73, p < .05. This effect may perhaps reflect the fact that the accumulation of alliance experience in dealing with distant cultures, rather than being effective, may lead firms to make inappropriate generalizations and apply a consistent set of alliance management routines across a heterogeneous set of cultural conditions. Thus, the probability that generalizations would be dysfunctional is likely to become higher when interacting with culturally distant partners leading to negative consequences for firm performance. We do not test Hypothesis 9c on the value of alliance experience for managing alliances with state-owned partners because there is no evidence that the link between the type of partner and the performance effects of alliances is moderated by any variable. We also find that the market rewards firms with greater experience with the host country with a larger gain in firm value (ρ = .09, p < .01)[8], thus providing support for Hypothesis 9d. Finally, consistent with Hypotheses 9e and 9f, results reported in Table 3.3 indicate that the effect of alliance experience (β = .32, p < .05) and country experience (β = .54, p < .05) are higher for equity alliances than for non-equity alliances. These results suggests that past experience in entering a focal country and in signing alliances is seen by the market as more valuable for equity than for non-equity alliances, suggesting that experiential learning is more beneficial in managing interorganizational cooperation when

[8] As an additional test of the hypothesized difference between the effects of alliance experience and country experience, we examined whether the relationship between country experience and the performance effects of strategic was curvilinear. Results from a moderator analysis provide no support for such a curvilinear relationship ($\beta_{Country\ experience\ squared}$ = -.60, p > .50).

this cooperation is not governed by detailed ex ante contracts.

DISCUSSION

The overall economic significance of strategic alliances and their pervasiveness across countries and industries highlight the importance of understanding whether they are on average creating or destroying value, and the conditions under which they yield a positive or negative impact on firm value. Despite the large number of empirical studies extant research provides no consensus on this effect (Gulati, 1998). The present meta-analysis cumulates two decades of research to answer this question.

Do firms benefit from entering strategic alliances? Based on a meta-analysis of 110 studies examining 32,596 strategic alliances formed between 1963 and 2001, our results lead to the strong conclusion that, on average, alliances create value and that this value is larger than comparable meta-analytic estimates of the gains obtained by bidders in mergers and acquisitions (Datta et al., 1992). Importantly, we find that this effect generalizes across time periods, industry sectors, and equity and non-equity alliances. We also find, however, that international alliances create more value for firms listed on US than on foreign stock exchanges, reflecting perhaps differences in the institutional environments in which firms operate or differences in the international strategies of U.S. and non-U.S. firms.

Alliances, however, are highly heterogeneous and perhaps more important from a theoretical and managerial perspective is to understand how the impact on the partnering firms varies with the diversity in motives for alliance formation and in the collaborative conditions under which they operate. The present paper offers a theoretical synthesis and a meta-analysis on the determinants of the impact of strategic alliances on firm value. Our results resolve several enduring empirical inconsistencies and suggest new theoretical extensions by offering empirical evidence on contingencies not addressed in prior research. Table 3.4 provides a summary of our results.

TABLE 3.4

Summary of Results for the Determinants of the Effects of Strategic Alliances on Firm Value[a]

Variable	Predicted sign	Result	Hypothesis supported?
Level of economic integration between home and host countries	∩	∩	Yes
Cultural distance	∩	Non-significant, other moderators indicated	No
Alliance relatedness	∩	∩	Yes
Partner relatedness	Non-significant	Moderated by governance structure, and geographic scope	No
Functional domain of the alliance	Marketing and production alliances > R&D alliances	R&D alliances > Marketing and production alliances	No
Industry concentration	+	Moderated by industry sector	No
Intangible assets	+	+	Yes
Free cash-flow	∩	Non-significant, other moderators indicated	No
Financial leverage	+	Moderated by governance structure, geographic scope, and industry sector	No
Intangible assets × Equity alliance	+	Non-significant, other moderators indicated	No
R&D alliances × Equity alliance	+	+	Yes
Governance structure: equity vs. non-equity	Non-significant	Non-significant	Yes
Equity share in the alliance	Non-significant	+	No
Alliance with foreign state-owned firm vs. for-profit firm	-	-	Yes
Prior ties	+	Non-significant	No
Alliance experience	∩	∪	No
Cultural distance × Alliance experience	+	-	No
Alliance with foreign state-owned firm × Alliance experience	+	Not applicable	No
Country experience	+	+	Yes
Alliance experience × Equity alliance	+	+	Yes
Country experience × Equity alliance	+	+	Yes

[a] The moderators governance structure, geographic scope, and industry sector of the alliance refer to differences between equity vs. non-equity alliances, international vs. domestic alliances, and alliances formed in manufacturing vs. non-manufacturing industries, respectively.

A key issue in alliance research is the relationship between the motives for alliance formation and firm value. This is important because it defines the scope of strategies and activities that can effectively be pursued in strategic alliances. Our results show that alliances allow firms to create value when pursuing a wide variety of strategies: expanding across geographic and product-market boundaries, exploiting knowledge interdependencies with other firms, and leveraging firm-specific assets across multiple domains. Interestingly, our results show that for most of the motives investigated, value creation, rather than being uniform, only occurs under a restricted set of contingencies. Thus, we find that international expansion is most successful when the host country's economy is moderately integrated with the economy of the partnering firm's home country. We also found that alliances can create value when they explore both similarities (high relatedness) and complementarities (low relatedness) between the alliance partners. In addition, we found that R&D alliances create more value than production or marketing alliances, but that equity R&D alliances create more firm value than non-equity R&D alliances. Our findings also suggest that the economic gains from increased market power obtained by establishing alliances in highly concentrated industries are higher in non-manufacturing than in manufacturing industries. We found that firms may create value by exploiting firm-specific intangible assets but our results show that this effect is not homogenous. Finally, our results indicate that the effect of the partnering firms' level of financial resources on the performance benefits of alliances depends on the source of these financial resources. Free cash flow has no consistent impact on the effects of alliances on firm value. In contrast, financial leverage creates more value in equity alliances formed in manufacturing industries. Collectively, these findings suggest that strategic alliances are flexible organizational mechanisms that can be employed to pursue multiple paths of corporate development but that value creation in strategic alliances is highly sensitive to a number of contingencies related to the type of interdependence that is exploited

between the partners, the firm-specific assets owned by the partnering firms, and the level of relatedness between the partnering firms and the alliance activity.

Our results show that the performance effects of strategic alliances are also determined by a wide range of collaborative conditions. Our finding that a high share of equity ownership in international alliances decreases firm value relative to a high share of equity ownership in domestic alliances suggests that allocating a high share of the alliance to local partners is critical to create an incentive structure that ensures that they will provide the all-important knowledge and support needed to operate in foreign countries. We also found that the relational structure of the alliance has important performance implications. In particular, the high coordination costs of partnering with a foreign state-owned company have negative effects on firm value. Contrary to our predictions, the positive effect of the existence of prior direct ties between the partnering firms on the impact of strategic alliances on firm value was only marginally significant. Moreover, these effects were only marginally heterogeneous suggesting that these findings are relatively robust. Importantly, our findings also provide new theoretical insights into the dynamics of organizational learning. Our research shows that while the experience of managing alliances has a U-shaped relationship with firm value, host country experience has a linear positive effect on firm value. In addition, we found that the effects of the accumulation of alliance and country experience differed between equity and on-equity alliances. These findings have important implications. Taken together, they suggest that the dynamics, processes, and consequences of the development of organizational knowledge and capabilities may differ significantly across experience domains.

Limitations and Future Research

Prior research has investigated over 90 distinct determinants of the link between strategic alliances and firm value. The plurality of theoretical perspectives and the limited overlap among studies in the variables chosen to explain the performance consequences of alliances implies that addressing this issue requires both a theoretical and an empirical synthesis of prior research. In this paper we offer a conceptual framework that integrates a wide range of determinants of the effects of strategic alliances on firm value. However, like any meta-analysis our study is limited to a subset of variables that have been repeatedly addressed in extant empirical studies. In addition, although our conceptual model proposes a contingency perspective on the determinants of the impact of alliance announcements on firm value, we where unable to fully investigate empirically its theoretical implications due to the limited availability of primary studies that provided empirical data on the performance effects of both distinct motives for alliance formation and distinct collaborative conditions.

These limitations and our meta-analytic evidence raise new theoretical questions and highlight the need for a new wave of empirical research investigating the link between strategic alliances and firm value. First, future theoretical and empirical research could develop, extend, and test the proposed conceptual framework. The integrative conceptual framework proposed in this paper suggests that the collaborative conditions under which strategic alliances operate can not only have a direct effect on the link between strategic alliances and firm value but, importantly, can moderate the link between the type of interdependence or asset exploited in the alliance and firm performance. This extends prior research on the economic consequences of strategic alliances which has dominantly emphasized the direct effects of alliance motives and collaborative conditions on firm value. Thus, rather than examining how distinct types of interdependencies or distinct collaborative conditions directly influence the effects of strategic alliances on firm value, the proposed

framework highlights the need for future research investigating how a particular type of interdependence (e.g., combination of complementary assets and activities) can have different impacts on firm value depending on the collaborative conditions under which it is exploited (e.g., differences in alliance experience). For instance, does the impact on firm value of having had prior ties depends on the motive for alliance formation, that is whether the alliance is formed to exploit economies of scale by combining similar activities, or to create value by exploiting complementarity between the knowledge base of the partnering firms? Future research could also extend the proposed framework by investigating the performance implications of different alliance motives or collaborative conditions not addressed in our meta-analysis.

Second, our results show that there remains some heterogeneity in research findings for most antecedents of the performance consequences of strategic alliances. This finding points to the need for more research on the relationship between each of the examined antecedents and firm value, especially in a multivariate context. Third, while prior research has focused primarily on theoretical innovation, emphasizing new determinants, future research should balance theoretical innovation with empirical replication (Eden, 2002). This would not only provide a more robust framework for testing the explanatory power of new determinants, but would also contribute to the development of a more consistent empirical base on which to build future empirical generalizations and move research on the performance effects of strategic alliances beyond its current preparadigm state toward a state of normal science (Kuhn, 1962).

Conclusion

Strategic alliances are a pervasive mode of corporate development. They also differ markedly in their motives, collaborative conditions, and the environments in which they operate. The present paper provides an integrative theoretical framework and meta-analytic evidence on a wide range of conditions under which alliances create and destroy economic value for the firms entering them. Our findings show that alliances provide a flexible mechanism for corporate development but that there are boundaries for value creation in strategic alliances. Our meta-analysis sheds new light on these boundaries: it reconciles inconsistent empirical findings, and extends prior research on the contingencies of value creation. We hope that the conceptual framework and the meta-analytic results provided in this paper will stimulate future research on the determinants of the link between strategic alliances and firm value.

CHAPTER FOUR[9]

DETERMINANTS OF STRATEGIC ALLIANCE PERFORMANCE: A META-ANALYSIS

STRATEGIC ALLIANCES have emerged over the past two decades as a prevalent mode of corporate development. They have also become a topic of central interest to organizational and strategy scholars, who have investigated the antecedents of alliance formation, the choice of governance structure, and how these initial conditions and subsequent partner behaviors influence alliance performance. Yet, despite continued scholarly effort, Gulati (1998) concluded in a review of the literature that understanding the determinants of alliance performance "remains one of the most interesting and also one of the most vexing questions" in the study of strategic alliances (p. 309). Indeed, prior empirical research on alliance performance has adopted a variety of theoretical perspectives which have not often been integrated. The emphasis on the development and testing of new theory rather than on empirical generalization has led to over 100 distinct variables being investigated as antecedents of alliance performance. Also, prior studies have produced inconsistent findings with respect to the relative contribution, magnitude, statistical significance, and direction of the determinants of alliance performance. To date, these findings have not been systematically combined to establish the generalizability of the antecedents of alliance performance and thus, despite considerable empirical research, no clear consensus exists regarding these antecedents.

[9] This chapter is the result of joint work with Rekha Krishnan. The list of studies included in this meta-analysis is provided in Appendix A.

Given the prevalence of diverse theoretical perspectives and the inconsistency of empirical findings, the purpose of this study is to provide a meta-analysis of the determinants of strategic alliance performance using data from 78 empirical studies involving 15,201 alliances. Thus, while Chapter 3 examined the link between alliance formation and firm value, the present chapter adopts a complementary level of analysis and investigates the antecedents of the performance of alliances themselves. Meta-analysis is a statistical technique for aggregating results across multiple empirical studies while correcting for potential sources of variation in study findings, such as sampling and measurement errors. Specifically, the present research has three objectives: (a) to identify among de wide range of determinants of alliance performance investigated in prior research those factors that effectively impact alliance performance and estimate with precision the magnitude of their effects, (b) to evaluate the generalizability of these effects across different empirical contexts and distinct operationalizations of alliance performance, and (c) to estimate the joint effect of initial conditions, governance structure and partner behavior on alliance performance by developing and testing an overall conceptual framework that includes those factors that have been most frequently linked to alliance performance. By cumulating empirical evidence across a wide range of empirical studies we are able to establish firm empirical generalizations on the determinants of strategic alliance performance.

THEORY AND HYPOTHESES

The performance of strategic alliances has been investigated from a variety of theoretical perspectives (Kogut, 1988; Reuer, 2004), including resource-based theory (e.g., Park and Martin, 2001), transaction cost economics (e.g., Sampson, 2004), real options (e.g., Kumar, 2005), and organizational learning theory (e.g., Barkema, Shenkar, Vermeulen, and Bell, 1997). These diverse perspectives have each emphasized the role of distinct types of factors in influencing alliance performance. Collectively, prior research has shown that

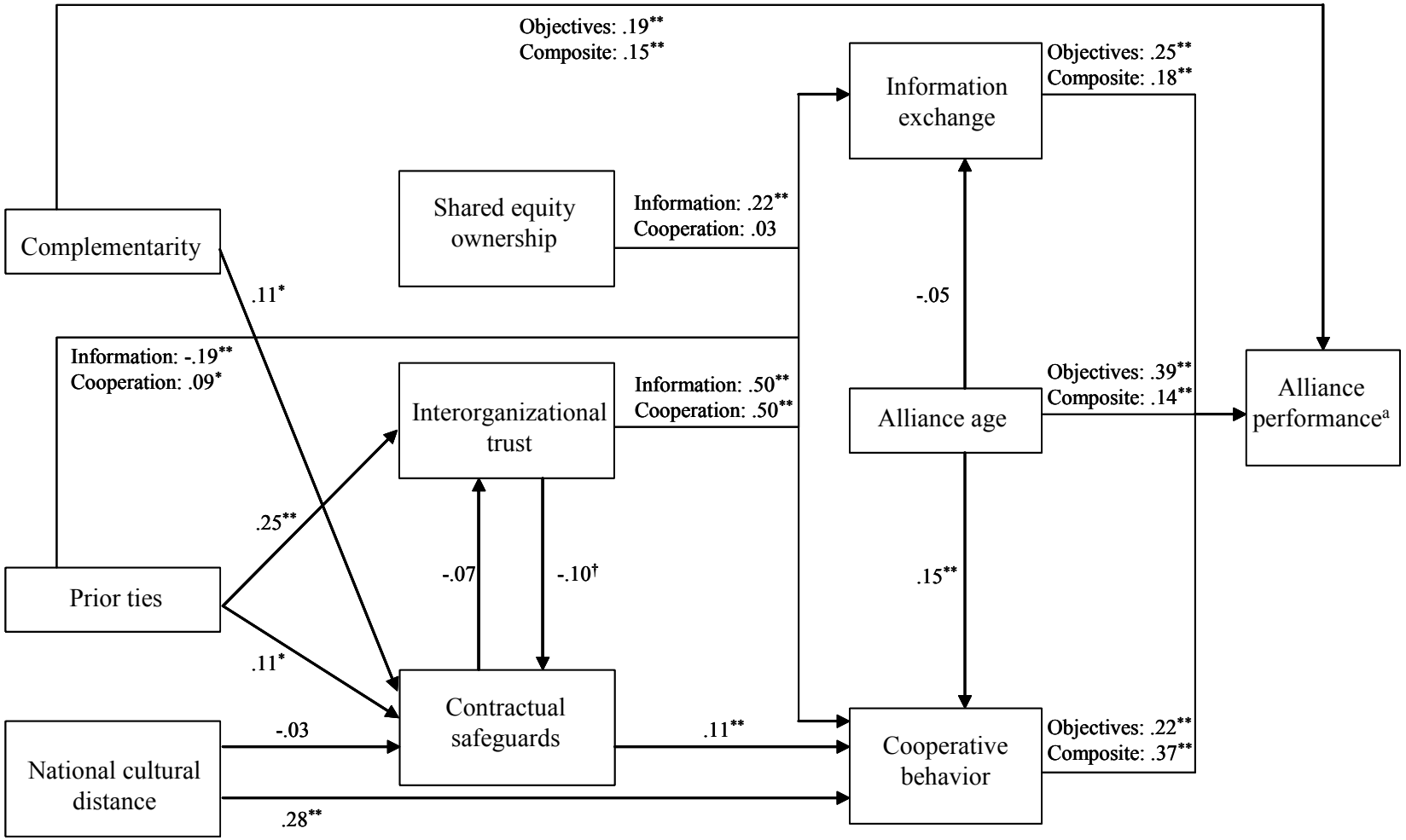
alliance performance is jointly determined by (a) the conditions present at the inception of the alliance, (b) the type of governance structure used in the alliance, and (c) the post-formation cooperative dynamics between the alliance partners. However, prior studies have been generally informed by a single theoretical perspective and as a result the different factors have not often been empirically investigated simultaneously within the same study. The model presented in Figure 4.1 draws on these diverse streams of research to examine the structural and behavioral determinants of alliance performance. To obtain robust meta-analytic estimates the conceptual model focuses on those factors that have been most frequently investigated in prior research.

Initial Conditions

Resource complementarity. Strategic alliances create value by providing an efficient governance mechanism for exploiting interdependencies between firms. Indeed, research adopting a transaction cost perspective has shown that alliances are formed when access to the relevant resources cannot be obtained through market transactions and when the relevant resources are linked to undesired assets and cannot be acquired separately (e.g., Hennart, 1991; Hennart and Reddy, 1997). The combination of resources owned by different firms is, therefore, the primary motive driving alliance formation and has a central influence on partner selection. For instance, Hitt et al. (2000) have shown that when forming international alliances firms seek partners that possess complementary resources and capabilities.

FIGURE 4.1

Determinants of Strategic Alliance Performance



[a] "Objectives" indicates that the dependent variable is the extent to which the alliance objectives were attained, and "Composite" indicates that the dependent variables is composite alliance performance. † $p < .10$; * $p < .05$; ** $p < .01$

Alliances may create value by combining similar resources, capabilities or activities to achieve economies of scale and share risks, or by pooling complementary resources, capabilities or activities to achieve economies of scope (Hennart, 1988). The combination of complementary resources may also increase the competitive position of the alliance by creating a distinctive bundle of resources and activities that is valuable, rare, and difficult to imitate or substitute (Dyer and Singh, 1998). Hence, because value can be created by combining complementary or similar assets and activities in an alliance we predict:

Hypothesis 1. The level of resource complementarity between the alliance partners will have no effect on alliance performance.

The nature of the resources combined in a strategic alliance may also have an indirect effect on alliance performance by influencing the choice of governance structure. The combination of complementary resources and activities requires considerable coordination between the alliance partners arising from the ongoing mutual adjustments needed to couple distinct resources and activities into an integrated process of value creation and thus realize the potential synergies from the alliance. Thus, the interdependence associated with resource complementarity may entail higher *coordination costs* in managing the alliance (Gulati and Singh, 1998).

Resource complementarity may create also a situation of cooperative co-specialization in which alliances are vehicles for exchanging access to idiosyncratic resources and capabilities owned by the alliance partners rather than for the voluntary or involuntary transfer of capabilities. Indeed, in a study of technological alliances Mowery, Oxley, and Silverman (1996) found that most alliances led to the cooperative co-specialization between the alliance partners in terms of their technological capabilities, and that in only 24 percent of alliances did the partners' technological capabilities become similar over time. However, mutual interdependence between the alliance partners stemming from cooperative co-

specialization may become asymmetrical dependence if one of the partners opportunistically internalizes the other partner's knowledge or capabilities (Zeng and Hennart, 2002). As a result, resource complementarity may also be associated with high *appropriation concerns* (Gulati and Singh, 1998; Zeng and Hennart, 2002). The anticipated coordination costs and appropriation concerns associated with alliances where partners pool complementary resources are, therefore, likely to lead the development of more complex contracts in an attempt to reduce opportunism by establishing safeguards and rules for responding to a wide range of contingencies (Parkhe, 1993). Hence,

> *Hypothesis 2. The level of resource complementarity between the alliance partners will be positively related to the level of contractual safeguards embedded in the strategic alliance.*

Prior alliances. Strategic alliances are not always discrete and independent events. Indeed, on many occasions firms engage in multiple sequential alliances over time whereby a particular alliance may be preceded by a history of cooperation between the alliance partners (e.g., Gulati, 1995). The accumulation of partner-specific experience through repeated alliances may in turn influence alliance performance in several ways. First, the accumulation of cooperative experience at the dyadic level, allows the partnering firms to increase their knowledge of each other's organizational processes, resources and capabilities and develop partner-specific routines regarding information exchange, conflict resolution and cooperation (Zollo, Reuer, and Singh, 2002). The presence of these routines at the inception of the alliance is likely to have a positive effect on the post-formation interaction between the alliance partners, facilitate information exchange and promote cooperative behavior. Prior research also suggests that the willingness of partnering firms to form repeated alliances is likely to reflect the presence of mutual trust between the alliance partners (Gulati, 1995). This baseline level of trust, present at the inception of an alliance, is likely to transfer to the new

cooperative venture. Hence,

Hypothesis 3a-b. The presence of prior alliances between the partnering firms will be positively related to (a) the level of information exchange and (b) the level of cooperative behavior in the strategic alliance.

Hypothesis 4. The presence of prior alliances between the partnering firms will be positively related to the level of trust in the strategic alliance.

Besides influencing the post-formation dynamics between the alliance partners, the history of prior cooperation between the partnering firms may also impact alliance performance by influencing transactions costs. The initial level of trust stemming from prior alliances and the accumulated experience of cooperation may, at the stage of alliance formation, reduce fears of opportunism and create an expectation of predictability regarding each other's behavior (Gulati, 1995). Because the development of complex contracts that stabilize partners' responses to multiple contingencies is costly and may decrease flexibility, trust may be used as a substitute for contractual safeguards. (Parkhe, 1993).

Hypothesis 5. The presence of prior alliances between the partnering firms will have a negative influence on the level of contractual safeguards embedded in the strategic alliance.

National cultural distance. National cultural distance between the alliance partners captures the extent to which the shared societal values and norms differ between the countries of the partnering firms. High levels of national cultural distance are likely to be reflected in differences in the partners' management systems and relational behaviors (e.g., Cushman and King, 1985; Kogut and Singh, 1988; Schuler and Rogovsky, 1998). These differences may in turn lead to conflicts and misunderstanding between the partnering firms, increase coordination costs, and create barriers to communication and knowledge transfer (e.g., Lyles and Salk, 1996). Hence,

Hypothesis 6. The level of national cultural distance between the partnering firms will be negatively related to the level of cooperative behavior in the strategic alliance.

National cultural distance may also impact transaction costs and influence the governance structure of the alliance (e.g., Hennart and Reddy, 1997). Indeed, firms may attempt to counteract the potential conflicts arising from cultural distance by adopting a number of motivational or structural solutions that reduce transaction costs by manipulating the perceived or actual payoff structure of the alliance so that the gains of mutual cooperation are higher than those of unilateral defection (Hennart and Zeng, forthcoming). Motivational solutions, such as extending the expected length of interaction, operate by changing the partners' perception of the gains of cooperation, while structural solutions, such as establishing a more extensive set of contractual safeguards, operate by increasing the economic gains of cooperation or costs of defection (Hennart and Zeng, forthcoming). Consistent with prior research on the determinants of alliance performance (e.g., Parkhe, 1993), our model focused on contractual safeguards as a key mechanism for aligning partners' incentives to cooperate. Because the potential hazards arising from high cultural distance between the partnering firms can be addressed by adopting a wide range of distinct structural and motivational solutions, we predict that, on average, no unique solution will dominate. Hence:

Hypothesis 7. The level of national cultural distance between the partnering firms will be, on average, unrelated to the level of contractual safeguards embedded in the strategic alliance.

Governance Structure

Research on strategic alliances has emphasized the importance of governance structure as a central determinant of alliance performance (e.g., Poppo and Zenger, 2002). The choice of governance structure is important because it provides a framework of rules and

incentives within which cooperation between the partnering firms unfolds and thus influences the partners' ability to realize the potential value from pooling complementary resources.

Prior research on the choice of governance structure and its performance implications for strategic alliances has been primarily based on transaction cost theory (e.g., Hennart, 1988). The core proposition of this theory is that alliance performance is determined by the extent to which the partnering firms align the properties of the governance structure with the attributes of the underlying transaction in a way that maximizes the partners' joint incentive to cooperate and maximizes the rents that can be obtained from establishing the cooperative venture (Sampson, 2004). Contractual safeguards and equity distribution constitute two important parameters in the design of governance structures that can be used to create joint incentives and curb opportunism.

Contractual safeguards. Contractual safeguards may create joint incentives for cooperation and limit opportunism in several ways. First, by establishing more complex contracts that specify partners' responses to multiple contingencies and establish rules and procedures for dispute resolution and for responding to unanticipated outcomes, partnering firms may increase the predictability of each other's behavior and restrict the range of circumstances in which opportunism might occur (Poppo and Zenger, 2002). Second, contracts may be used to minimize monitoring costs by specifying performance measurement systems such as performance targets, third party monitoring, or the exchange of operational information (Lui and Ngo, 2004; Poppo and Zenger, 2002). Finally, contracts may reduce opportunism by specifying a payoff structure that rewards mutual cooperation and increases the costs arising from unilateral or mutual defection (Lui and Ngo, 2004; Parkhe, 1993). However, because contractual safeguards are only one of the distinct mechanisms available to protect the partnering firms against opportunism and to increase the level of cooperative behavior among the alliance partners (Hennart and Zeng, forthcoming) we expect that, on

average, there will be no systematic link between the level of contractual safeguards and the level of cooperative behavior in the alliance. Moreover, transaction cost theory postulates that firms typically select the optimal level of contractual safeguards for governing interorganizational cooperation in a way that reflects transaction characteristics and maximizes cooperation between the alliance partners (Hennart, 1988). Hence,

> *Hypothesis 8. The level of contractual safeguards embedded in the strategic alliance will be unrelated to the level of cooperative behavior exhibited by the alliance partners.*

Equity distribution. In equity alliances the distribution of equity ownership between the alliance partners provides a powerful mechanism for maximizing the partnering firms' incentive to cooperate. Equity alliances align joint incentives by rewarding the partnering firms with a share of the residual profits of the alliance, rather than by specifying in an ex-ante contract the partners' contribution and the profit distribution (Hennart and Zeng, forthcoming). Thus, they are particularly valuable under conditions in which it is difficult to evaluate a priori what is being exchanged, such as when partners are transferring tacit knowledge (Hennart, 1988). Equity alliances are also efficient in unstable and uncertain environments where changes in the alliance may be required to ensure adaptation but the direction of these changes in unknown (Hennart, 1988). In these conditions, repeated modifications and renegotiation of the alliance contract to respond to environmental changes could prove costly and slow. In the context of equity alliances an important factor is the distribution of equity ownership between the alliance partners. Strategic alliances where both partners have an equal share of the ownership provide both partners with an equal claim on the alliance profits and costs. Indeed, shared equity distribution is the ownership distribution arrangement where cooperation brings the maximum joint benefits and unilateral defection the highest penalty for the alliance partners. Thus, by creating a payoff structure that

maximizes the partnering firms' joint incentive to cooperate, shared equity alliances should have a positive effect on the post-formation interaction between the partners. Thus,

Hypothesis 9a-b. Shared equity distribution between the partnering firms will be positively related to (a) the level of information exchange and (b) the level of cooperative behavior in the strategic alliance.

Interorganizational trust. Prior research suggests that interorganizational trust may also operate as an important governance mechanism in strategic alliances (e.g., Popo and Zenger, 2002; Zaheer, McEvily, and Perrone, 1998). Interorganizational trust reflects the bilateral expectation that the alliance partner's behaviors will be predicable, consistent with initial commitments and non-opportunistic (Zaheer et al., 1998). Trust may play multiple roles in governing the combination of resources and activities in the alliance (Zaheer et al., 1998). First, because the presence of mutual trust is associated with low expectation of opportunism, trust is likely to be accompanied by lower monitoring activities and will facilitate negotiations. This in turn should reduce transaction and monitoring costs, and increase the alliance's adaptiveness to changing environments. Second, the expectations that the partner is both willing and able to fulfill its commitments and will refrain from acting opportunistically should promote information exchange and increase mutual cooperation in the alliance (Lane, Salk, and Lyles, 2001). Hence,

Hypothesis 10a-b. The level of interorganizational trust between the partnering firms will be positively related to (a) the level of information exchange and (b) the level of cooperative behavior in the strategic alliance.

There has been considerable debate regarding the status of contractual safeguards and trust as governance mechanisms. A number of authors have suggested that, relative to contractual safeguards, trust provides an alternative mechanism for governing the combination of resources (e.g., Aulakh, Kotabe, and Sahay, 1996; Bradach and Eccles, 1989;

Faulkner, 2000; Gulati, 1995). These studies suggest that trust may function as a substitute for contract-based control by providing a more effective mechanism for reducing opportunism, providing incentives for cooperation, and reducing the costs of adaptation. In contrast, other studies suggest that trust may complement, rather than substitute, formal governance mechanisms such as contractual safeguards (e.g., Luo, 2002b; Poppo and Zenger, 2002; Lui and Ngo, 2004). Poppo and Zenger (2002) suggest, for instance, that while contracts provide a baseline set of procedures to regulate cooperation and the payoff structure under a foreseeable set of contingencies, trust promotes cooperation and adaptation under conditions of unexpected or unpredictable change and may counteract exchange hazards that are not contractually specified. These divergent theoretical perspectives lead to opposing predictions. The notion of substitutability suggests that the governance of strategic alliances is primarily based on one type of mechanism, either contractual safeguards or trust (Poppo and Zenger, 2002). Hence,

> *Hypothesis 11a. The level of interorganizational trust between the partnering firms will be negatively related to the level of contractual safeguards embedded in the strategic alliance.*

The notion of complementarity suggests, instead, that the presence of mutually agreed contracts may promote the development of mutual trust between the partnering firms and that the presence of trust may also facilitate the renegotiation and flexibility of contractual safeguards (Poppo and Zenger, 2002). Thus,

Hypothesis 11b. The level of interorganizational trust between the partnering firms will be positively related to the level of contractual safeguards embedded in the strategic alliance.

Post-Formation Dynamics

Although initial conditions and the choice of governance structure are central elements in alliance formation, the ability to realize the potential value from pooling

resources and activities owned by different firms is primarily determined by the post-formation interaction between the alliance partners and how it evolves over time. Indeed, a number of theoretical accounts and clinical studies on the evolution of alliances suggest that both the imprinting effects of initial conditions and governance decisions, and the relational processes that unfold between the partnering firms are fundamental to understanding alliance performance (e.g., Ariño and de la Torre, 1998; Doz, 1996; Ring and Van de Ven, 1994). Prior research suggests that cooperative behavior and information exchange, or the lack thereof, are fundamental parameters that characterize the post-formation dynamics between the alliance partners (e.g., Mohr and Spekman, 1994; Sarkar, Echambadi, Cavusgil, and Aulakh, 2001).

Information exchange reflects the frequency, quality, breath and depth of information exchanged between the partnering firms (e.g., Mohr and Spekman, 1994). Frequent and detailed information exchange facilitates the coordination of the alliance activities, reduces information asymmetries, facilitates the identification of new opportunities for exploiting complementarities between the partners, and increases the speed and flexibility of adaptation to internal or external changes with positive effects on alliance performance.

Cooperative behavior refers to the extent to which the partners deliberately engage in activities focused on ensuring coordination, respond to the needs of the other partner, strive to achieve mutually beneficial solutions in conflict resolution, and are committed to maintaining a satisfactory partnership (e.g., Luo, 2002b; Mohr and Spekman, 1994). Thus, cooperative behavior is likely to facilitate conflict resolution, to increase coordination and to encourage investments in relationship-specific assets. Thus,

Hypothesis 12a-b. The level of (a) information exchange and (b) cooperative behavior will be positively related to alliance performance

An important feature of alliance arrangements is that they will need to be changed as

events unfold (Ariño and de la Torre, 1998; Doz, 1996; Ring and Van de Ven, 1994). In particular, the accumulation of collaborative experience is likely to lead to the development of relational routines between the alliance partners (Deed and Rothaermel, 2003; Zollo et al., 2002). These routines may encompass multiple domains of the relationships including coordination of the operational activities, conflict resolution, and information exchange, and may have positive effects on alliance performance. Hence,

Hypothesis 13a-c. Alliance age will be positively related to (a) the level of information exchange and (b) cooperative behavior between the alliance partners, and (c) alliance performance.

METHODS

Sample

We combined multiple data collection strategies to identify empirical studies of strategic alliance performance. First, articles were identified through a bibliographic search of computerized databases. ABI/Inform Global, EconLit, JSTOR, Kluwer Online, Elsevier Science Direct, and the Social Science Citation Index were searched using the terms 'joint venture(s)' and 'strategic alliance(s)'. Second, we performed manual searches (over the 1980 to 2004 period) of 10 leading journals in management and marketing, including *Academy of Management Journal, Administrative Science Quarterly, Journal of International Business Studies, Journal of Management, Journal of Marketing, Journal of Marketing Research, Management Science, Organization Science, Organization Studies,* and *Strategic Management Journal*. Third, we performed Internet searches using standard search engines. Finally, we examined the reference sections of all the articles retrieved and of prior narrative reviews of the strategic alliance literature (e.g., Gulati, 1998).

Inclusion criteria. We determined the eligibility of studies for the meta-analysis on the basis of several criteria. First, we focused on studies that measured alliance performance

in terms of objective financial indicators or informants' perceptual assessment of performance. Studies based on alliance duration as a proxy for performance were excluded because duration fails to distinguish between the different causes of termination. Alliance termination may be due to failure, itself a result of partner behavior or of outside events over which they have no control (Hennart, Roehl and Zeng, 2002), or to success, as the alliance is disbanded having achieved its goal. Moreover, longevity may not reflect performance but may instead reflect the presence of barriers to exiting the alliance (Gulati, 1998; Hennart, Roehl, Zietlow, 1999). Second, a study had to report on one or more relationships between an antecedent of performance and a measure of alliance performance. Third, a study had to report the sample size and correlations or other statistics that could be transformed into correlation coefficients using the formulas provided by Hunter and Schmidt (1990: 272).

Coding. The two authors independently coded each study. The construct operationalizations reported in the original studies were used to classify all correlations. Table 4.1 provides a summary overview of the definitions of the constructs used in the present study. The coding process identified five distinct operationalizations of alliance performance: (a) measures of alliance performance based on informants' assessment of the extent to which the alliance attained its initial objectives; (b) composite measures of alliance performance that measured the outcomes of the alliance in terms of many criteria, typically including overall satisfaction with the alliance, economic performance, quality of collaboration, and knowledge transfer; (c) measures based exclusively on economic indicators of alliance performance such as return on investment or market share of the alliance; (d) measures based on the informants' overall satisfaction with the alliance; and (e) measures based on the informants' overall satisfaction with the partner. Although we coded correlations relating the various determinants of alliance performance to each of the five indicators, only for three measures (attainment of objectives, composite performance, and

economic performance) was there sufficient cumulative evidence (three or more independent estimates) to warrant their inclusion in the meta-analysis (cf. Dalton, Daily, Certo, and Roengpitya, 2003). The overall level of interrater reliability for coding decisions was 98%. Inconsistencies were resolved through discussion.

Nonindependence. To ensure that our analysis met the assumption of sample independence, we used two criteria. First, if a sample reported more than one correlation for a single relationship, these correlations were averaged and only the average correlation was included in the meta-analysis. Second, if multiple publications were based on the same or partially overlapping dataset, we did not include correlations between the same variables from more than one study. In such cases, we included the correlation based on the larger sample size.

Outliers. Outlying correlations were identified by computing Huffcutt and Arthur's (1995) sample-adjusted meta-analytic deviancy statistic. On the basis of these analyses, 14 outliers were dropped from the dataset. This process resulted in a final dataset of 265 correlations from 78 empirical studies each corresponding to an independent sample with a total sample size of 15,201 strategic alliances. The removal of outliers is important because meta-analyses often include a limited number of studies that due to their idiosyncratic methodological features (Schmidt et al., 1993) or sample composition can have considerable impact on the results. However, because the uniqueness of their methodology or sample it is often not possible to correct for these characteristics when estimating the meta-analytic correlation.

In the present study, outliers generally led to larger estimated correlations for the relationships investigated while results remained consistent with those of the analysis reported below. Thus, by removing outliers we provide more conservative results.

TABLE 4.1

Definition of Constructs and Representative Measures

Construct	Definition and Measures
Complementarity	*Construct definition:* The extent to which the strategic alliance pools complementary assets, knowledge, or activities. *Representative measures:* Luo (2002a); Lyles and Salk (1996)
Prior ties	*Construct definition:* Number of prior alliances between the partnering firms. *Representative measures:* Hoang and Rothaermel (2005); Zollo, Reuer, and Singh (2002)
National cultural distance	*Construct definition:* The level of national cultural distance between the alliance partners, typically measured using Kogut and Singh's (1988) index. *Representative measures:* Fey and Beamish (2001); Luo and Park (2004)
Shared Equity Ownership	*Construct definition:* Indicates strategic alliances characterized by the equal distribution of equity ownership between the alliance partners. *Representative measures:* Aulakh, Kotabe, and Sahay (1996); Hill and Hellriegel (1994)
Interorganizational trust	*Construct definition:* The extent to which the alliance partners share a bilateral expectation that each other's behaviors will be predicable, consistent with initial commitments and non-opportunistic. *Representative measures:* Inkpen and Currall (1997); Zaheer, McEvily, and Perrone (1998)
Contractual safeguards	*Construct definition:* The extent to which the contract governing the alliance is detailed, highly customized, includes an extensive set of terms, clauses, and procedures and specifies responses to a wide range of contingencies concerning the establishment, operation, decision-making, conflict resolution, and termination of the strategic alliance. *Representative measures:*Luo (2002b); Parkhe (1993)
Alliance age	*Construct definition:* The number of years since the formation of the alliance. *Representative measures:* Hoang and Rothaermel (2005); Lyles and Salk (1996)
Information exchange	*Construct definition:* The extent, frequency, timeliness, and openness of information exchange between the partnering firms. *Representative measures:* Mohr and Spekman (1994); Smith and Barclay (1997)
Cooperative behavior	*Construct definition:* The extent to which the alliance partners are responsive to each other's goals, and deliberately attempt to work together and manage the alliance in a way that is mutually satisfactory and achieves the goals of both partners *Representative measures:* Luo (2002b); Emden, Yaprak, and Cavusgil (2005)
Attainment of objectives	*Construct definition:* The extent to which the initial objectives of the alliance were achieved. *Representative measures:* Hatfield and Pearce (1994); Yan and Gray (2001)
Composite performance	*Construct definition:* Multidimensional measures of alliance performance that typically measure the outcomes of the alliance in terms of overall satisfaction with the alliance, economic performance, quality of collaboration, and knowledge transfer. *Representative measures:* Mjoen and Tallman (1997); Zollo, Reuer, and Singh (2002)
Economic performance	*Construct definition:* The performance of the alliance measure in terms of financial and economic indicators such as ROI or ROS. *Representative measures:* Li, Lam, and Qian (2001); Luo (2002b)

Meta-Analytic Procedure

Our meta-analysis was conducted using Hunter and Schmidt's (1990) psychometric meta-analysis method. This approach allows for the correction of statistical artifacts, such as artificial dichotomization and measurement error, and thus provides a more precise estimate of the magnitude and variance of a relationship in the population of interest. Correlations were individually corrected for artificial dichotomization of continuous independent and dependent variables, range restriction in independent and dependent dichotomous variables, and for the downward bias in r as a measure of the population correlation (Hunter and Schmidt, 1990). These correlations were then meta-analyzed and corrected for sampling error. Finally, and since information on measurement error was not available for all individual correlations, the meta-analytic correlations were then corrected for measurement error in the dependent and independent variables using the method of artifact distributions (Hunter and Schmidt, 1990). We also estimated 95 percent confidence intervals around the mean-weighted correlations. This process yielded a meta-analytic correlation matrix, reported in Table 4.2, where the correlation coefficient in each cell is obtained from a meta-analysis of the relationship between the variables aggregated across all the studies synthesized. The table reports a sample-size-weighted average correlation corrected for statistic artifacts (ρ), the standard deviation of ρ (SD_{ρ}), the number of independent samples used to estimate each ρ (k), and the total sample size for each correlation (N).

TABLE 4.2

Meta-Analytic Correlation Matrix[a]

	1	2	3	4	5	6	7	8	9	10	11
1. Alliance age	-	787 (7)	882 (6)	1,360 (8)	882 (5)	322 (3)	1420 (9)	531 (3)	260 (3)	513 (6)	1,087 (10)
2. Information exchange	-.07 (.00)	-	184 (2)	282 (2)	1,020 (6)	143 (2)	581 (4)	191 (2)	765 (8)	374 (5)	844 (7)
3. Contractual safeguards	.03 (.15)	.03 (.00)	-	513 (2)	1,246 (4)	276 (3)	667 (5)	922 (4)	601 (5)	378 (3)	1744 (10)
4. Shared ownership	-.10 (.13)	.18 (.10)	.10 (.20)	-	599 (3)	504 (3)	959 (5)	373 (2)	255 (1)	280 (4)	883 (7)
5. Cooperative behavior	.12 (.00)	.39 (.09)	.10 (.00)	-.06 (.00)	-	960 (4)	737 (4)	821 (4)	792 (7)	728 (8)	1,065 (7)
6. Complementarity	-.03 (.00)	.05 (.00)	.10 (.00)	-.06 (.00)	.18 (.05)	-	410 (4)	190 (2)	535 (5)	257 (4)	451 (5)
7. Cultural distance	-.02 (.00)	.08 (.15)	-.00 (.14)	-.02 (.00)	.09 (.12)	.04 (.02)	-	493 (3)	249 (2)	114 (2)	1,146 (9)
8. Prior ties	-.11 (.00)	-.09 (.00)	.07 (.00)	-.08 (.06)	.19 (.22)	-.08 (.00)	-.05 (.14)	-	499 (4)	522 (4)	1,170 (9)
9. Interorganizational trust	-.04 (.09)	.42 (.10)	-.05 (.00)	-.13 (.00)	.41 (.21)	.04 (.2)	-.35 (.00)	.24 (.00)	-	529 (6)	1117 (10)
10. Attainment of objectives	.39 (.17)	.33 (.00)	-.07 (.03)	.01 (.23)	.41 (.09)	.23 (.00)	-.11 (.00)	.31 (.00)	.58 (.22)	-	335 (3)
11. Composite performance	.17 (.08)	.32 (.07)	.09 (.11)	-.14 (.00)	.49 (.17)	.22 (.07)	-.09 (.08)	.30 (.00)	.41 (.11)	.30 (.00)	-

[a] Lower diagonal: mean corrected correlations ρ and standard deviations SD_ρ of ρ (in parentheses). Upper diagonal: total sample size *N* and number of studies *k* (in parentheses) from which the ρ were estimated. * indicates significant *Q*-statistic, suggesting the presence of moderators.

Moderator analysis. For each meta-analytic correlation we conducted homogeneity analyses to evaluate the extent to which the estimated correlations were drawn from the same population. Homogeneity analyses were based on the *Q* statistic which follows a chi-square distribution (Hedges and Olkin, 1985). Significant values of Q indicate that the relationship is heterogeneous and suggest the presence of moderators in the relationship. For the determinants that had an heterogeneous impact on alliance performance we investigated the effect of three potential substantive moderators capturing important alliance and environmental characteristics: (a) form of the alliance: equity vs. non-equity alliances; (b) industry sector of the alliance: manufacturing vs. non-manufacturing; and (c) geographic scope of the alliance: domestic vs. international alliances. To test the effect of these potential moderators we performed weighted regression analyses in which sample size is used as a weight (Hedges and Olkin, 1985)[10].

Structural equations modeling. The meta-analytic correlation matrix was used as an input to test our model. The measure of alliance performance based on economic indicators was not included in this analysis as the number of correlations between this measure and the other dependent and independent variables was too low. Because our model is recursive, parameters can be estimated using Ordinary Least Squares regression (e.g., Geyskens, Steenkamp, and Kumar, 1999). Since correlations in each cell were based on different sample sizes, model estimation was based on the harmonic mean *N* of 461.

[10] To ensure stability in our results we restricted our moderator analyses to correlations based on five or more independent samples.

RESULTS

Meta-Analysis

Table 4.3 presents the meta-analytic results for the direct effects of initial conditions, governance structure, and post-formation dynamics on three dimensions of alliance performance: (a) the extent to which the initial objectives of the alliance were attained (objectives); (b) a composite indicator of alliance performance (composite); and (c) economic performance (economic).

The results indicate that initial conditions, interorganizational trust, and post-formation dynamics between the partnering firms are key drivers of alliance performance. Indeed, the type of resources and activities pooled in the alliance ($\rho_{objectives}$ = .23, $\rho_{composite}$ = .22), the existence of prior alliances ($\rho_{objectives}$ = .31, $\rho_{composite}$ = .30, $\rho_{economic}$ = .21), the age of the alliance ($\rho_{objectives}$ = .39, $\rho_{composite}$ = .17, $\rho_{economic}$ = .32), and the level of interorganizational trust ($\rho_{objectives}$ = .58, $\rho_{composite}$ = .41, $\rho_{economic}$ = .41), of information exchange ($\rho_{objectives}$ = .33, $\rho_{composite}$ = .32), and of cooperative behavior between the alliance partners ($\rho_{objectives}$ = .41, $\rho_{composite}$ = .49, $\rho_{economic}$ = .35) have relatively large and positive effects on performance, whether measured by the extent to which the partners are able to achieve the objectives of the alliance, by the composite performance of the alliance, or by its economic performance.

In contrast, the cultural distance between the partners ($\rho_{composite}$ = .09, $\rho_{economic}$ = .10), the ownership structure of the alliance ($\rho_{objectives}$ = -.01, $\rho_{composite}$ = .14, $\rho_{economic}$ = .09), and the level of contractual safeguards ($\rho_{objectives}$ = .07, $\rho_{composite}$ = .09) have relatively small direct effects on alliance performance.

The positive performance effects of initial conditions reflect the importance of the resources combined in the alliance as the primary source of potential value creation. In addition,

the strong direct effects of post-formation dynamics highlight the role of the collaborative behavior between the partnering firms in realizing this potential value. Finally, the limited impact of formal governance mechanisms and cultural distance on alliance performance is likely to reflect the fact that, as hypothesized, these factors primarily influence the post-formation dynamics between the partnering firms and thus have an *indirect* rather than a *direct* effect on alliance performance.

Moderator Analysis

The results, reported in Table 4.3, show that the effects of most determinants of alliance performance generalize across primary studies. In fact, of the 23 effects investigated only 8 had heterogeneous effects on alliance performance, as indicated by significant Q-statistics. Specifically, our results show the presence of moderators for the effects of contractual safeguards, interorganizational trust, cooperative behavior, and alliance age on alliance performance.

Table 4.4 reports the results of the moderator analyses. Results show that the performance effect of contractual safeguards is lower for equity alliances than for non-equity alliances (β = -.47; p < .10). Although only marginally significant, this finding suggests that the particular way in which parties to equity alliances are rewarded (i.e., by sharing the residual) acts as a self-enforcing substitute to ex-ante contracts (Hennart 1988) . In addition, results suggest that the performance effects of contractual safeguards are higher for international relative to domestic alliances (β = .75; p < .01). This is consistent with the notion that international alliances are generally more difficult to govern as a result of cultural distance and environmental uncertainty and thus benefit from more comprehensive contractual stipulations.

Regarding the effects of trust on alliance performance our results do not provide support

for a consistent pattern of moderators across the various performance measures. We found, however, that the link between trust and the attainment of alliance objectives is stronger for equity than for non-equity alliances (β = .49; p < .05). This suggests that trust and equity governance may function as complementary mechanisms for governing strategic alliances.

Our results also show that the benefits from cooperative behavior are marginally higher for international alliances (β = .48; p < .10) suggesting that the partners' collaborative behavior may help overcome cultural differences. Finally, we found that the performance effects of alliance age are higher for alliances in manufacturing (β = .78; p < .05), indicating that perhaps the benefits from experience accumulation are higher for these type of alliances.

TABLE 4.3

Meta-Analytic Results for the Determinants of Strategic Alliance Performance[a]

Predictor	Performance Variable	k	N	Mean r	ρ	Var. ρ	$CI_ρ$ 5%	$CI_ρ$ 95%	Residual Var.	% Var. Explained	Q
				Initial Conditions							
Complementarity	Attainment of objectives	4	257	.19	.23**	.00	.07	.31	.00	87.57	4.57
	Composite performance	5	451	.18	.22**	.00	.09	.27	.00	76.95	6.50
Cultural distance	Composite performance	9	1,146	-.08	-.09**	.01	-.14	-.02	.01	6.70	14.83
	Economic performance	3	1,311	-.08	-.10**	.00	-.14	-.03	.00	79.02	3.80
Prior ties	Attainment of objectives	4	522	.23	.31**	.00	.15	.31	.00	123.72	3.23
	Composite performance	9	1,170	.23	.30**	.00	.17	.28	.00	159.04	5.66
	Economic performance	3	529	.15	.21**	.00	.06	.23	.00	131.15	2.29
				Governance Structure							
Contractual safeguards	Attainment of objectives	3	378	-.05	-.07	.00	-.15	.05	.00	95.00	3.16
	Composite performance	10	1,744	.07	.09**	.01	.03	.12	.01	43.03	23.24**
Interorganizational trust	Attainment of objectives	6	529	.48	.58**	.05	.42	.55	.03	18.20	32.96**
	Composite performance	10	1,117	.34	.41**	.01	.29	.39	.01	48.41	2.65*
	Economic performance	4	658	.32	.41**	.01	.25	.39	.01	48.06	8.32*
Shared ownership	Attainment of objectives	4	280	.01	.01	.05	-.11	.13	.03	31.17	12.83**
	Composite performance	7	883	-.11	-.14**	.00	-.17	-.04	.00	136.87	5.11
	Economic performance	6	2,616	-.07	-.09**	.00	-.11	-.03	.00	77.72	7.69
				Post-Formation Dynamics							
Information exchange	Attainment of objectives	5	374	.27	.33**	.00	.17	.36	.00	165.38	3.02
	Composite performance	7	844	.26	.32**	.07	.20	.33	.00	67.59	1.01
Cooperative behavior	Attainment of objectives	8	728	.33	.41**	.01	.27	.40	.01	61.64	12.98
	Composite performance	7	1,065	.40	.49**	.03	.35	.45	.02	21.96	31.88**
	Economic performance	4	905	.27	.35**	.00	.20	.33	.00	352.47	1.13
Alliance age	Attainment of objectives	6	513	.32	.39**	.03	.24	.40	.02	33.92	17.68**
	Composite performance	10	1,087	.14	.17**	.01	.08	.20	.00	68.33	14.63
	Economic performance	7	4,503	.24	.32**	.02	.22	.27	.01	12.30	56.89**

[a] k = number of correlations from independent studies; N = total sample size; Mean r = sample-size-weighted mean uncorrected correlation; ρ = estimate of population correlation; Var_ρ = estimate of the true population variance ρ; CIρ 5% = lower bound of the 95% confidence interval for ρ; CIρ 95% = upper bound of the 95% confidence interval for ρ; Residual Var. = residual variance; % Var. explained. = percentage of observed variance accounted for by statistical artifacts; Q = chi-square test for heterogeneity. * $p < .05$; ** $p < .01$

TABLE 4.4

Results of Weighted Regression Analyses for the Determinants of Strategic Alliance Performance[a]

Predictor	Performance Variable	Equity alliance	International alliance	Manufacturing	R^2	Q residual	*N*	*k*
Contractual safeguards	Composite performance	-.47†	.75**	.14	.42*	13.21*	1,744	10
Interorganizational trust	Attainment of objectives	.49*	-.21	.16	.27	15.25**	529	6
Interorganizational trust	Composite performance	-.08	-.31	-.17	.22	13.01*	1,117	10
Cooperative behavior	Composite performance	-.33	.48†	-.02	.15	21.34**	1,065	7
Alliance age	Attainment of objectives	-.08	-.01	.78*	.68*	4.61†	513	6
Alliance age	Economic performance			.28	.08	13.20*	4,503	7

[a] Cell entries are standardized coefficient estimates. *k* = number of correlations from independent studies; *N* = total sample size; *Q residual* = chi-square test for heterogeneity in regression residuals.

† $p < .10$

* $p < .05$

** $p < .01$

Multivariate Analysis of the Determinants of Alliance Performance

In Figure 4.1 we report the results for our hypotheses regarding the determinants of alliance performance using OLS regression. Since multiple regression controls for the relationships between the independent variables, this analysis provides a more precise test of our hypotheses than our previous bivariate analyses.

Initial conditions. According to Hypothesis 1, the combination of complementary resources, capabilities, and activities in the alliance has a positive effect on alliance performance. Consistent with this hypothesis, complementarity had a positive effect on both the attainment of alliance objectives ($\beta = .19$; $p < .01$) and composite performance ($\beta = .15$; $p < .01$). In addition, we predicted that complementarity would not only impact alliance performance directly, but also indirectly by influencing the governance structure of the alliance. Corroborating Hypotheses 2 we found that complementarity had a positive effect on the level of contractual safeguards embedded in the alliance ($\beta = .11$; $p < .05$). Thus, the higher the degree of partner interdependence stemming from combining complementarity resources and activities, the higher the level of contractual safeguards in the alliance.

Hypotheses 3a, 3b, 4 and 5 propose that the existence of prior ties between the alliance partners would influence the governance structure of the alliance and the post-formation dynamics between the partners by creating a baseline level of interorganizational trust and fostering the development of collaborative routines. Providing support for hypothesis 4, our results show that the presence of prior ties had a positive effect on the level of interorganizational trust ($\beta = .25$; $p < .01$). Corroborating Hypothesis 3b but not Hypothesis 3a, we found that prior ties had a positive impact on cooperative behavior ($\beta = .09$; $p < .05$) but a negative effect on information exchange ($\beta = -.19$; $p < .05$), respectively. That is, a history of prior mutual cooperation between the alliance partners was associated with lower rather than higher levels of information exchange. This finding may perhaps reflect the fact

that prior alliances provided partners with extensive opportunities for information exchange and for the development of collaborative routines which, in turn, attenuate the need for intensive exchange of information in subsequent alliances. Contrary to Hypothesis 5, the existence of prior ties was associated with higher and not lower levels of contractual safeguards ($\beta = .11$; $p < .05$). Thus, we found no evidence for the notion that the accumulated trust and joint experience arising from prior ties allow firms to reduce the complexity of subsequent contractual arrangements. What the results suggest, instead, is that the knowledge obtained from joint collaborative experience is used by firms to refine their subsequent contractual agreements, perhaps in an attempt to establish more effective governance mechanisms.

Hypotheses 6 and 7 focused on the potential negative impact that differences in national culture between the partners may have on the collaborative relationship and how firms may attempt to mitigate these effects by increasing the level of contractual safeguards. Interestingly we found that, contrary to Hypothesis 6, the level of cultural distance had a positive, rather than negative, effect on interorganizational cooperative behavior ($\beta = .28$; $p < .01$). Thus, firms appear to generally respond to cultural differences by engaging in a higher level of cooperative behavior with their partners. However, this response is not typically effective as indicated by the negative direct effect of cultural distance on alliance performance (see Table 4.2). As expected, cultural distance had no impact on the level of contractual safeguards in alliances ($\beta = -.03$; n.s.). Thus, Hypothesis 7 was not supported.

Governance structure. Hypotheses 8, 9a, 9b, 10a, and 10b predicted that the governance structure of the alliance would be a key determinant of the post-formation dynamics between the alliance partners. Hypothesis 8 focused on the role of contractual safeguards. It predicted that because more complex contracts create a normative framework to deal with a wide range of contingencies and increase predictability and the costs of

opportunism, they should promote cooperative behavior. Corroborating this hypothesis, the results show that the level of contractual safeguards has a positive effect on cooperative behavior ($\beta = .11$; $p < .01$).

Hypothesis 9a and 9b focused on the structure of incentives associated with a shared distribution of equity ownership between the partners, relative to an asymmetric distribution. It predicted that shared equity ownership would be associated with higher incentives to exchange information and cooperative behavior. Support for our hypotheses was mixed. Results show a positive relationship between shared ownership and information exchange ($\beta = .22$; $p < .01$), and a nonsignificant link between shared ownership and partner cooperative behavior ($\beta = .03$; n.s.). Thus, we found support for Hypothesis 9a but not for 9b. Hypotheses 10a and 10b examined the impact of interorganizational trust on the post-formation collaborative behavior of the partnering firms. They predicted a positive effect of trust on both information exchange and cooperative behavior, respectively. Consistent with both hypotheses, we found a positive relationship between interorganizational trust and the level of information exchange ($\beta = .50$; $p < .01$), and between trust and cooperative behavior ($\beta = .50$; $p < .01$). Importantly, trust was the determinant that had the strongest effect on the post-formation level of information exchange and cooperative behavior between the partnering firms, suggesting its importance in shaping the evolution of strategic alliances.

The relative status of trust and contractual safeguards as governance mechanisms was tested by examining the direction of this relationship (cf. Poppo and Zenger, 2002). A negative relationship between trust and contractual safeguards would show that these two governance mechanisms are substitute, whereas a positive relationship would suggest that there are complements. Meta-analytic results reported in Table 4.2 show that the bivariate relationship between these two variables is nonsignificant ($\rho = -.05$; n.s.) and that this result is homogeneous and thus generalizes across primary studies (*Q-statistic* = 1.84; n.s.). When

examining this relationship while controlling for the effect of other variables, the evidence is similar. Results reported in Figure 4.1 show that the level of contractual safeguards has no significant effect on interorganizational trust (β = -.07; n.s.), and that trust has a marginally significant (β = -.10; p < .07) negative effect on contractual safeguards. Hypotheses 11a and 11b are not supported. In sum, the meta-analytic evidence suggests that contractual safeguards and trust are independent governance mechanisms that evolve and operate in parallel.

Post-formation dynamics. Hypotheses 12a and 12b examined the impact on alliance performance of post-formation dynamics between the alliance partners. Specifically, we predicted that higher levels of information exchange and cooperative behavior would allow partners to fully exploit the potential value arising from combining assets, activities, and capabilities in the alliance and would thus lead to higher performance. Consistent with these hypotheses, our results show that information exchange and cooperative behavior had a positive effect on the attainment of the alliance objectives ($\beta_{\text{information exchange}}$ = .25, $\beta_{\text{cooperative behavior}}$ = .22 ; p < .01) and composite performance ($\beta_{\text{information exchange}}$ = .18, $\beta_{\text{cooperative behavior}}$ = .37 ; p < .01).

Finally, we investigated the effect of alliance age on the partners' collaborative behavior and alliance performance. Our results provide support for the positive effect of alliance age on cooperative behavior (β = .15; p < .01), the attainment of alliance objectives (β = .39; p < .01) and composite performance (β = .14; p < .01), corroborating Hypotheses 13b and 13c. We did not find support for Hypothesis 13a as the effect of alliance age on information exchange was not significant (β = -.05; n.s.). These findings suggest that, over time, partners develop dyadic routines for cooperating and that these routines are beneficial for alliance performance.

DISCUSSION

The study of the determinants of alliance performance has been one of the most popular topics in research on strategic alliances. However, prior research has emphasized the development and testing of new theory rather than the establishment of empirical generalizations. Thus, despite extensive research no clear consensus exists regarding the antecedents of alliance performance. The present research cumulates 78 empirical studies to establish a quantitative synthesis of the influence of initial conditions, governance structure and post-formation dynamics on alliance performance. Table 4.5 provides a summary of our results.

To estimate the relative contribution of initial conditions, governance structure, and post-formation dynamics in explaining alliance performance we conducted two hierarchical regression analyses of the two measures of alliance performance (attainment of alliance objectives and composite performance) on all the distinct predictors included in our meta-analysis. Our results show that, collectively, the determinants investigated account for 67 percent and 41 percent of the variation in alliance performance measured in terms of attainment of objectives and composite performance, respectively. Importantly, all three classes of factors contributed to explain heterogeneity in strategic alliance performance. Specifically, initial conditions explained 17 percent ($F(3,437) = 3.43$; $p < .01$), governance structure 27 percent ($F(3,434) = 7.06$; $p < .01$), and post-formation dynamics 23 percent ($F(3,431) = 101.11$; $p < .01$) of the variation in the attainment of alliance objectives. Similarly, initial conditions explained 16 percent ($F(3,437) = 27.09$; $p < .01$), governance structure 11 percent ($F(3,434) = 22.02$; $p < .01$), and post-formation variables 14 percent ($F(3,431) = 34.26$; $p < .01$) of the variation in composite alliance performance. These supplementary analyses provide support for the importance of these three different classes of factors for understanding alliance performance. Below we summarize and interpret our

findings regarding the various determinants of alliance performance and discuss potential directions for future research.

TABLE 4.5

Summary of results

Hypothesized Relationship	Hypothesis	Parameter Estimate	Hypothesis supported?
Governance Structure			
Prior ties → Trust	+	0.25**	Yes
Contract → Trust	+/-	-0.07	No
Complementarity → Contract	+	0.11*	Yes
Prior ties → Contract	-	0.11*	No
Cultural distance → Contract	+	-0.03	No
Trust → Contract	+/-	-0.10†	No
Post-Formation Dynamics			
Prior ties → Information exchange	+	-0.19**	No
Trust → Information exchange	+	0.50**	Yes
Shared Ownership → Information exchange	+	0.22**	Yes
Alliance age → Information exchange	+	-0.05	No
Prior ties → Cooperative behavior	+	0.09*	Yes
Cultural distance → Cooperative behavior	-	0.28**	No
Trust → Cooperative behavior	+	0.50**	Yes
Shared Ownership → Cooperative behavior	+	0.03	No
Contactual safeguards → Cooperative behavior	+	0.11**	Yes
Alliance age → Cooperative behavior	+	0.15**	Yes
Strategic Alliance Performance			
Complementarity → Attainment of objectives	+	0.19**	Yes
Alliance age → Attainment of objectives	+	0.39**	Yes
Information exchange → Attainment of objectives	+	0.25**	Yes
Cooperative behavior → Attainment of objectives	+	0.22**	Yes
Complementarity → Composite performance	+	0.15**	Yes
Alliance age → Composite performance	+	0.14**	Yes
Information exchange → Composite performance	+	0.18**	Yes
Cooperative behavior → Composite performance	+	0.37**	Yes

† $p < .10$; * $p < .05$; ** $p < .01$

Initial Conditions

The meta-analytic evidence reported in this study suggests that the resources combined in the alliance are a key factor shaping the formation and performance of the strategic alliance. Indeed, we found that complementarity in the assets, activities, and

capabilities combined in the alliance influenced its governance structure by increasing the level of contractual safeguards and also had a direct impact on alliance performance.

The development of collaborative routines and a baseline level of trust as a result of a prior history of cooperation between the partnering firms also had a relatively strong effect on both the governance structure and on the subsequent evolution of the collaborative relationship. Specifically, our findings show that the presence of prior ties increases the level of interorganizational trust. Remarkably, and contrary to our predictions we found that prior ties led to higher, rather than lower, levels of contractual safeguards. This finding is in contrast with research suggesting that because prior ties are associated with higher levels of mutual trust (e.g., Gulati, 1995) they should reduce the risks of opportunism and lead to lower levels of contractual safeguards (e.g., Parkhe, 1993). Our evidence seems to suggest, instead, that the increased partner-specific collaborative experience developed over time is used to craft more complex and detailed contracts. We also found that prior ties led to lower, rather than higher levels of information exchange. This finding may reflect the fact that considerable knowledge may have been exchanged between the partners in prior alliances and that, as a result, there is a lower knowledge asymmetry between the alliance partners in subsequent alliances. In addition, it may also suggest that the development of partner-specific collaborative routines may reduce the need for ongoing communication between the alliance partners.

Finally, despite the considerable volume of research examining the impact of cultural distance on internationalization and on alliance performance the present research suggests that this factor has a limited effect on the formation, evolution, and performance of strategic alliances. Our findings show that the cumulative correlation between cultural distance and alliance performance is positive, rather than negative, but small. These results are consistent with recent meta-analytic evidence by Tihanyi, Griffith, and Russell (2005) suggesting that,

on average, cultural distance has no significant effect on entry mode choice, international diversification, and the performance of multinational firms.

Taken together, our findings on the role of initial conditions highlight several potential avenues for future research. First, research could extend the range of initial conditions beyond those that have been addressed in the present study. Although research exists on factors such as the motives underlying alliance formation (e.g., Hatfield and Pearce, 1994), the degree of relatedness between the partnering firms (e.g., Saxton, 1997), the structural chararcteristics of the alliance (Zeng and Hennart, 2002), the partners' overall alliance experience (e.g., Zollo, Reuer and Singh, 2002) and organizational culture distance (e.g., Pothukuchi et al., 2002), there were too few empirical studies relating these factors to other variables in our model to allow their inclusion in our meta-analysis. Second, the unexpected findings regarding the link between prior ties and both contractual safeguards and information exchange emphasize the need for new theoretical and empirical work investigating in more detail the nature of these relationships and the underlying mechanisms. Third, the evidence obtained in this research regarding the limited role of national cultural distance, together with similar findings on the impact of this variable on the behavior and performance of multinational firms (Tihanyi et al., 2005) suggests that more research is needed to understand the role of cultural distance in alliances.

Governance Structure

Our meta-analytic findings attest to the importance of governance mechanisms in influencing the post-formation dynamics of the alliance and, in turn, its performance. Specifically, our findings show that higher levels of trust are associated with higher levels of information exchange and cooperative behavior between the partnering firms. We found that interorganizational trust was the strongest determinant of the extent of cooperative behavior by the alliance partners and of alliance performance. However, we also found that the effect

of trust on alliance performance, despite being frequently studied, has produced mixed results. Moderator analyses in Table 4.4 indicate that this result is heterogeneous (significant Q residuals) and that no consistent pattern of moderators accounts for this heterogeneity. Given the centrality of trust as a determinant of alliance performance, future research should explore other potential moderating factors beyond those explored here.

Our findings also emphasize the importance of contractual safeguards and equity distribution in shaping collaboration in the alliance. We found that the presence of contractual safeguards promotes cooperation between the alliance partners and that a shared equity distribution increased information exchange. However, in contrast with the notion that equity distribution may influence the structure of incentives to cooperate in the alliance, the meta-analytic evidence did not find support for a link between these two variables. This may perhaps reflect the fact that firms align the equity distribution in the alliance with the characteristics of the transaction in order to maximize cooperation. Thus, different ownership structures are equally effective as long as a partner's share of the residual profits of the alliance is proportional to its contribution.

An important debate in the strategic alliance literature is whether trust and contractual safeguards are substitutes or complements (e.g., Lui and Ngo, 2004). The cumulative evidence in this study suggests the interesting possibility that, rather than being substitute or complementary, these two mechanisms may be independent of each other. In other words, the processes underlying the development of trust and the design of contractual safeguards appear to operate in parallel and do not influence each other. Future research is needed, not only on the performance implications of distinct governance structures varying in the levels of trust and contractual safeguards, but also on the processes driving the configuration of governance structures in strategic alliances.

Post-Formation Dynamics

Finally, our results show that the post-formation collaborative dynamics between the alliance partners are key determinants of alliance performance. Indeed both information exchange and cooperative behavior had consistent and relatively strong effects on performance. Importantly, our results also suggest that, over time, partners tend to develop dyadic routines for collaboration and that these routines are beneficial for alliance performance. Specifically, our results show that older alliances generally exhibited higher levels of performance. These findings emphasize the importance of investigating the evolutionary and behavioral aspects of collaboration to fully understand the development and performance of strategic alliances. It is, however, important to make two qualifications when interpreting these findings. First, most of the studies investigated are based on cross-sectional assessments of alliance characteristics and performance which are often based on subjective evaluations made by the alliance partners. This raises concerns regarding the causality of the relationship between the alliance's relational attributes and post-formation dynamics and alliance performance and the possible operation of common method bias. Indeed, it is plausible to assume that in successful alliances the partners' satisfaction with the outcomes of the alliance transfers to their evaluation of the levels of trust, cooperative behavior, and information exchange between the partners. Similarly, the measures of trust, cooperative behavior and performance used in prior research may be tapping into related dimensions by which managers evaluate alliance performance and, as a result, all three constructs may reflect managers' overall evaluation of the alliance. Thus, the observed correlation between trust, cooperative behaviors and performance may not necessarily imply that trust and cooperative behavior are in fact operating in the alliance and that they were the material causal antecedents of performance. Second, the results that we obtained regarding the effects of alliance age on performance may reflect the operation of survival bias, rather than the

unfolding of developmental processes inherent to interorganizational cooperation (e.g., Ring and Van de Ven, 1994). Although, performance may vary considerably among young alliances, old alliances are not likely to be failures.

To date our understanding of alliance evolution remains limited. Future research may expand the range of variables measuring the post-formation collaborative processes that emerge between the alliance partners. In addition, considerable theoretical and empirical progress can be made by increasing the focus on longitudinal designs that capture more closely the evolutionary dynamics of collaboration.

In sum, our study is the first to conduct a quantitative synthesis of the extensive literature and obtain empirical precise generalizations on the determinants of strategic alliance performance. The empirical evidence provides strong evidence for the importance and the unique contribution of initial conditions, governance structure, and post-formation dynamics for understanding alliance performance.

CHAPTER FIVE

CONCLUSION

STRATEGIC ALLIANCES have gradually emerged over the last decades as a primary vehicle for corporate growth. Firms increasingly use strategic alliances to enter new markets, develop new products, and obtain access to relevant knowledge and technological capabilities. However, while alliances can promote growth and create value they can also destroy it. Indeed, a number of studies suggest that approximately fifty percent of all alliances fail (e.g., Kogut, 1989; Bleeke and Ernst, 1993). Thus, the prevalence of alliances coupled with the considerable variation in their success rates has led to an increased effort by both scholars and practitioners to find out whether firms benefit from entering alliances and what makes for a successful alliance. Yet, despite the large number of studies conducted to date, past empirical research provides no consensus on (a) whether, on average, firms benefit from entering alliances, (b) why some alliances create more firm value than others, and (c) the determinants of the performance of alliances themselves. In this dissertation we used meta-analysis to address these questions and obtain firm empirical generalizations on the performance outcomes of strategic alliances.

One of the central questions that scholars have asked is whether firms benefit from entering strategic alliances. Prior research has generally addressed this question by investigating the impact of alliance announcements on the stock market value of the partnering firms. For instance, does firm value, on average, increase or decrease in response to alliance announcements? In addition, does it matter if the alliance is domestic or international, if the partnering firms are active in similar or dissimilar product-market

domains, or if the alliance is equity or non-equity? However, determining with precision the impact of a specific alliance announcement on a firm's overall stock market value requires (a) measuring the observed change in firm value, and (b) estimating what the stock value would have been had the alliance not been announced, that is isolating the effect of the alliance announcement from other influences on overall firm value. There are many ways in which these issues may be addressed and, therefore, researchers must make a number of methodological choices regarding the particular event study approach that is used to estimate the alliance announcement–firm value link. Given that there is considerable variation across studies in the methodology used, there is the risk that the particular event study methodology used may influence the results. If this is the case, then it is difficult to draw conclusions from such studies without knowing the potential importance and direction of the bias. To date, there has been no systematic investigation on whether the magnitude of estimated abnormal returns in event studies is robust to the various methodological choices taken by researchers.

In Chapter 2 we conducted a meta-analysis to examine how the choice of event study methodology influenced the findings of individual studies examining stock market reactions to strategic alliance announcements. Our results show that the length of the event window systematically influences the magnitude of estimated abnormal returns, with the use of longer event windows leading to larger abnormal returns. However, we found that the magnitude of the impact of alliance announcements on abnormal returns does not significantly vary with the methodology used. Specifically, the exclusion of confounding events, the length of the estimation period, and the specification of the return-generating process did not have a significant influence on results. Hence, we can be confident that the results of prior empirical studies on the impact of alliance announcements on firm value are not systematically influenced by the methodology employed. This finding provided the basis for the development of Chapter 3.

Having established that the observed variation in study findings does not reflect methodological differences across studies, we integrated past empirical studies to identify the substantive factors that influenced the effect of alliance announcements on firm value. The empirical evidence obtained in this chapter contributes toward resolving apparent inconsistencies on the direction of this effect. We found that alliances do, on average, create value for the partnering firms and that this effect generalizes across equity and non-equity modes of governance, manufacturing and non-manufacturing industries, and different time periods. However, the cumulative empirical evidence also suggests that there is considerable heterogeneity in the performance outcomes of strategic alliances. To address this issue, Chapter 3 investigated how the type of interdependencies exploited in an alliance, the collaborative conditions between the alliance partners, and organizational experience explain why some alliance announcements create more value than others. Overall, our findings lead to three main conclusions. First, they show that although strategic alliances are an effective governance mechanism for exploiting different types of interdependence between firms, value is created under a limited set of conditions. We found, for instance, that firms may create value by forming partnerships with local firms to enter new geographic markets, but that value creation is highest when the host countries' economies are moderately integrated with those of the investor. We also found that R&D alliances, that pool together knowledge and resources to develop new products, are most effective when the governance structure is equity-based rather than non-equity based. Overall, the finding that value creation in strategic alliances is not only a function of the type of interdependence exploited in the cooperative venture, but also of the collaborative conditions present at the inception of the alliance highlights the need for developing theoretical models and management practices that take these conditions into account.

Second, the findings reported in Chapter 3 also show that the collaborative conditions

between the partnering firms influence the impact of alliances on firm value. We found, for instance, that establishing partnerships with foreign governments and that owning a large equity share in foreign affiliates have negative effect on value creation. In contrast, the level of cultural distance and the prior history of cooperation between the alliance partners had no impact on value creation. Finally, we found that the effects of organizational experience on value creation depend on the type of experience being accumulated. In particular, whereas experience with a host country had a linear positive effect on the link between alliance formation and firm value, the effect of experience with alliances was curvilinear (U-shaped). Moreover, we found that the effects of both country- and alliance-experience are contingent on the governance structure of the alliance, with experience being more beneficial in equity rather than non-equity alliances. Taken together, the findings reported in this chapter contribute to the identification of the sources and boundaries of value creation in strategic alliances.

Chapter 4 adopts a different level of analysis: it focuses on the determinants of the performance of alliances themselves. Whereas research on the link between alliance formation and firm value focuses primarily on the types of interdependencies exploited in the alliance and the initial collaborative conditions at the inception of the alliance, research on the antecedents of alliance performance emphasizes the cooperative processes and post-formation dynamics that emerge between the partnering firms as key determinants of the partnership's ability to realize value from cooperation. In this chapter we used meta-analysis to test an integrative model that investigates the impact of initial conditions, governance structure, and post-formation dynamics on alliance performance. First, we found that, together, the variables examined in this model accounted for a relatively high proportion of variation in alliance performance (between 41 and 67 percent). Second, we found that each of these factors accounted for an important proportion of variation in alliance performance. On

average, initial conditions explained 16.5 percent, governance structure 19 percent, and post-formation dynamics 18.5 percent of heterogeneity in alliance performance. This suggests that all three classes of factors are important elements in the study and management of alliances. Finally, our results provide insights not only on the impact of initial conditions, governance structure and post-formation dynamics on alliance performance, but also on the relationships between these factors. Specifically, we find that initial conditions such as the level of complementarity between the partnering firms and the cultural distance between them influence the governance structure of the alliance, and that both the initial conditions and governance structure shape, in turn, the post-formation dynamics that emerge between the alliance partners.

LIMITATIONS AND FUTURE RESEARCH

Meta-analytic findings are based on an analysis of the cumulative empirical evidence on the relationship between two variables. Thus, although meta-analysis is not limited by the methodological or substantive characteristics of any particular study, it is limited by the set of attributes that are shared across the various studies that comprise a research literature. As a result the scope and type of relationships and the potential moderators of these relationships that can be investigated depend on how often these relationships have been investigated in the literature. This implies that we were only able to focus on a restricted set of determinants of the performance outcomes of alliance and a narrow set of moderator variables. For instance, although the model proposed in Chapter 3 suggests that the collaborative conditions of the alliance and the experience of the partnering firms moderate the link between the type of interdependence being exploited in the alliance and the impact of the alliance on firm value, the cumulative evidence available did not allow us to fully test this implications of the model. Despite these limitations, we were able to identify a number of important contingencies that influence value creation in strategic alliances. Particularly, in Chapter 4 we found that the

factors investigated accounted for a relatively large proportion of the overall variation in alliance performance.

By establishing a set of empirical generalizations and integrating a large volume of empirical research, meta-analysis has the potential not only to clarify what is known but also to point out what is not, and thus to stimulate new empirical research. Two major recurring themes emerge from the studies presented in this dissertation. First, the determinants of the performance outcomes of strategic alliances are multifaceted. Indeed, taken together, the findings reported in the preceding chapters show that the performance outcomes of alliances are determined by the type of resources combined in the alliance, the governance structure of the alliance, the collaborative conditions present at the inception of the alliance, the experience of the alliance partners, and the post-formation dynamics between the partnering firms. Not only do these factors account for an important proportion of heterogeneity in the performance outcomes of alliances, their relative contribution is similar. This suggests that theoretical and empirical research on alliances as well as managerial practice requires attention to a broad range of factors that jointly influence the ability to create and appropriate value through cooperation. Alternatively, scholars may attempt to limit this complexity by choosing samples that naturally control for these variations, for example by looking at the determinants of performance of vertical alliances in a given industry of a given country. Second, our findings are remarkably consistent in suggesting that the effects of most antecedents on (a) alliance performance and on (b) the link between alliance announcements on firm value are not constant but are instead either non-linear or moderated by other factors. This points out to the need for developing a contingency framework for understanding the performance outcomes of strategic alliances and for additional research that investigates non-linearity and potential moderators of value creation in alliances. The research reported in this dissertation takes an initial step in this direction.

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APPENDIX A

Articles Included in the Meta-Analyses: Chapters 2 and 3[a]

Author(s)	Year	Publication Outlet
Allen and Phillips	2000	JF
Anand and Khanna	2000	SMJ
Arnott and Rasheed	1997	JEWB
Baek and Kwok	2002	IREF
Bailey, Janakiramanan and Lamba	2003	UM
Bajo, Bigelli and Sandri	1998	JMG
Barkema and Piaskowska	2003	UM
Bayona, Corredor and Santamaria	2002	JAM
Beck, Larsen and Pinegar	1996	PBFJ
Blonigen, Tomlin and Wilson	2003	UM
Borde, Whyte, Wiant and Hoffman	1998	JMFM
Burton, Lonie and Power	1999	JBFA
Campart and Pfister	2003	UM
Chan, Kensinger, Keown and Martin	1997	JFE
Chang and Chen	2002	JBFA
Chang, Chen and Lai	2004	CP
Chang and Huang	2002	GFJ
Chang and Kuo	2002	CP
Chen, Ho, Lee and Yeo	2000	JBF
Chen and Hu	1992	JABR
Chen, Hu and Shieh	1991	FM
Chen and Siems	2001	EFR
Cheng, Fung and Lam	1998	IBR
Chiou and White	2003	UM
Chotanakarn	1990	UD
Chung, Koford and Lee	1993	QREF
Cordeiro	1993	CP
Crutchley, Guo and Hansen	1991	FM
Das, Sen and Sengupta	1998	AMJ
Elayan	1993	JRER
Etebari	1993	GFJ
Ferris, Sen, Lim, Yeo	2002	JIBMIM
Finnerty, Owers and Rogers	1986	MIR
Frohls, Keown, McNabb and Martin	1998	MDE
Garcia-Feijoo and Wingender	2003	CP
Gleason, Lee and Mathur	2002	IREF
Gleason, Mathur and Mathur	1999	FM
Gleason, Mathur and Mathur	2002	UM
Gleason, Mathur and Singh	2000	IBR
Gleason, Mathur and Wiggins	2003	FR
Gulati and Wang	2003	BC
Guo, Keown and Sen	1999	BC
Gupta, McGowan, Misra and Missirian	1991	FR
Gupta and Misra	2000	JFR
Hanvanich and Cavusgil	2001	IBR
Hanvanich, Miller, Richards and Cavusgil	2003	IBR
Hauswald and Hege	2002	UM
He, Myer and Webb	1997	JRER
Houston and Johnson	2000	JMR
Hu, Chen and Shieh	1992	MIR
Hubler and Meschi	2001	APBR
Irwanto, Vetter and Wingender	1999	JFSD
Johnson and Houston	2000	JFQA
Jones and Danbolt	2003	UM
Kale, Dyer and Singh	2002	SMJ
Karamanos	2002	UM
Keown, Laux and Martin	1999	UM
Kim	1997	JEB
Kim and Park	2002	MIR
Koh and Sinha	1991	CP
Koh and Venkatraman	1991	AMJ
Lee and Wyatt	1990	FR
Liu	2004	UM
Lummer and McConnell	1990	BC
Madhavand and Prescott	1995	AMJ
Mathur, Gleason and Mathur	1999	JEWB
Mathur and Waheed	1991	JABR
McConnell and Nantell	1985	JF
McGahan and Villalonga	2003	UM
Merchant	1997	BC
Merchant	2000	MIR
Merchant	2002	MIR
Merchant and Schendel	2000	SMJ
Meschi and Cheng	2002	JWB
Meschi and Hubler	2003	APJM
Mohanram and Nanda	1996	CP
Mohanram and Nanda	1998	UM
Neill, Pfeiffer and Young-Ybarra	2001	JHTM
O'Reilly-Allen and Zantout	2003	UM
Ojah, Seitz and Rawashdeh	1997	FR
Owhoso, Gleason, Mathur and Malgwi	2002	IBR
Pablo and Subramanian	2002	UM
Park	2004	SMJ
Park and Kim	1997	JBV
Park and Kim	1999	JIM
Park, Mezias and Song	2004	JM
Pinegar and Ravichandran	1997	BC
Prather and Min	1998	MFJ
Rajgopal, Venkatachalam and Kotha	2000	JAR
Ramaya, Khayum and Smith	2003	CP
Ravichandran and Pinegar	1991	JHTM
Ravichandran and Pinegar	1995	BC
Ravinchandran and Sa-Aadu	1988	REE
Reuer	2000	JIBS
Reuer and Koza	2000	SMJ
Rodriguez	1998	UM
Schut and van Frederikslust	2003	UM
Sleuwaegen, Schep, Hartog, and Commandeur	2003	LRP
Suarez and Garcia-Canal	2003	LRP
Subramani and Walden	2002	UM
Ueng and Kim	1996	MBR
Ueng, Kim and Lee	2000	IRFA
Ueng, Ojah	2003	UM
Waheed and Mathur	1995	JBF
Wild	1994	CP
Wolff and Reed	2000	MDE
Woolridge	1988	JACF
Woolridge and Snow	1990	SMJ
Wu and Wei	1998	RIO
Zantout	1995	JEF

Articles Included in the Meta-Analyses: Chapter 4 [a]

Author(s)	Year	Publication Outlet
Aulakh, Kotabe and Sahay	1996	JIBS
Boateng and Glaister	2002	IBR
Bucklin and Sengupta	1993	JMKT
Child and Yan	2003	JMS
Choi and Beamish	2004	JIBS
Cullen, Johnson, and Sakano	1995	JIBS
Cullen, Johnson, and Sakano	2000	JWB
Deeds and Rothaermel	2003	JPIM
Demirbag and Mirza	2000	IBR
Ding	1997	JIM
Emden, Yaprak and Cavusgil	2005	JBR
Fey and Beamish	2001	OSt
Fryxell, Dooley and Vryza	2002	JMS
Garcia-Canal, Valdes-Llaneza and Arino	2003	OSt
Gudergan, Devinney and Ellis	2003	UM
Hatfield and Kohn	2004	UM
Hatfield and Pearce	1994	JBV
Heide and Stump	1995	JBR
Hill and Hellriegel	1994	OSc
Hoang and Rothaermel	2005	AMJ
Hu and Chen	1996	JBR
Inkpen and Birkenshaw	1994	IBR
Inkpen and Currall	1997	BC
Isobe, Makino and Montgomery	2000	AMJ
Kemp		UM
Konopaske, Wernerand Neupert	2002	JBR
Lane, Salk and Lyles	2001	SMJ
Lasserre	1999	APJM
Lee and Beamish	1995	JIBS
Lee	2001	JBR
Lee, Chen and Kao	2003	JBR
Li, Lam and Qian	2001	JIBS
Lin and Germain	1998	JIBS
Lopez-Navarro and Camison-Zornoza	2003	IBR
Lui and Ngo	2004	JM
Luo	1995	MAJB
Luo	1997	OSc
Luo	1999	JBR
Luo	2002[a]	SMJ
Luo	2002b	JM
Luo and Chen	1997	BC
Luo and Park	2004	JIBS
Luo and Tan	2003	MIR
Luo, Shenkar and Nyaw	2001	JIBS
Lyles, Doanh, and Barden	2000	UM
Lyles and Salk	1996	JIBS
Lyles and Baird	1994	MIR
Makino and Delios	1996	JIBS
Mitsuhashi	2003	OSt
Mjoen and Tallman	1997	OSc
Mohr and Spekman	1994	SMJ
Nielsen		UM
Norman	2004	JBR
Parkhe	1993	AMJ
Pearce	2001	JMS
Perry, Sengupta and Krapfel	2004	JBR
Poppo and Zenger	2002	SMJ
Pothukuchi, Damanpour, Choi, Chen and Park	2002	JIBS
Ramaseshan and Loo	1998	IBR
Ramaswamy, Gomes and Veliyath	1998	IBR
Robins, Tallman and lindquist	2002	SMJ
Sarkar, Echambadi, Cavusgil and Aulakh	2001	JAMS
Saxton	1997	AMJ
Sengupta, Castaldi and Silverman	2000	JTM
Sim and Ali	1998	JWB
Smith and Barclay	1997	JMKT
Tallman, Sutcliffe and Antonian	1997	BC
Teegen and Doh	2002	UM
Yan and Gray	2001	JMS
Yeheskel, Zeira and Shenkar	2001	JIM
Young, Gilbert and McIntyre	1996	JBR
Zaheer, McEvily and Perrone	1998	OSc
Zeira, Newburry and Yeheskl	1997	MIR
Zeybek, O'Brien and Griffith	2003	IBR
Zollo, Reuer and Singh	2002	OSc

[a] *Abbreviations for the publication outlets are as follows:* ***AMJ*** *: Academy of Management Journal;* ***APBR*** *: Asia Pacific Business Review;* ***APJM*** *: Asia Pacific Journal of Management;* ***BC*** *: Book chapter;* ***CP*** *: Conference presentation;* ***EFR*** *: Economic and Financial Review;* ***FM*** *: Financial Management;* ***FR*** *: Financial Review;* ***GFJ*** *: Global Finance Journal;* ***IBR*** *: International Business Review;* ***IREF*** *: International Review of Economics and Finance;* ***IRFA*** *: International Review of Financial Analysis;* ***JAR*** *: Journal of Accounting Research;* ***JABR*** *: Journal of Applied Business Research;* ***JACF*** *: Journal of Applied Corporate Finance;* ***JAM*** *: Journal of Asset Management;* ***JBF*** *: Journal of Banking and Finance;* ***JBF*** *: Journal of Banking and Finance;* ***JBFA*** *: Journal of Business Finance and Accounting;* ***JIBMIM*** *: Journal of Business Markets, Institutions, and Money;* ***JBR*** *: Journal of Business Research;* ***JBV*** *: Journal of Business Venturing;* ***JEWB*** *: Journal of East-West Business;* ***JEB*** *: Journal of Economics and Business;* ***JEF*** *: Journal of Economics and Finance;* ***JF*** *: Journal of Finance;* ***JFSD*** *: Journal of Finance and Strategic Decisions;* ***JFQA*** *: Journal of Financial and Quantitative Analysis;* ***JFE*** *: Journal of Financial Economics;* ***JFR*** *: Journal of Financial Research;* ***JHTM*** *: Journal of High-Technology Management;* ***JIBS*** *: Journal of International Business Studies;* ***JIM*** *: Journal of International Marketing;* ***JM*** *: Journal of Management;* ***JMG*** *: Journal of Management and Governance;* ***JMS*** *: Journal of Management Studies;* ***JMKT*** *: Journal of Marketing;* ***JMR*** *: Journal of Marketing Research;* ***JMFM*** *: Journal of Multinational Financial Management;* ***JPIM*** *: Journal of Product Innovation Management;* ***JRER*** *: Journal of Real Estate Research;* ***JAMS*** *: Journal of the Academy of Marketing Science;* ***JTM*** *: Journal of Transnational Management;* ***JWB*** *: Journal of World Business;* ***LRP*** *: Long Range Planning;* ***MIR*** *: Management International Review;* ***MDE*** *: Managerial and Decision Economics;* ***MAJB*** *: Mid-Atlantic Journal of Business;* ***MBR*** *: Multinational Business Review;* ***MFJ*** *: Multinational Finance Journal;* ***OSc*** *: Organization Science;* ***OSt*** *: Organization Studies;* ***PBFJ*** *: Pacific-Basin Finance Journal;* ***OREF*** *: Quarterly Review of Economics and Finance;* ***REE*** *: Real Estate Economics;* ***RIO*** *: Review of Insdustrial Organization;* ***SMJ*** *: Strategic Management Journal;* ***SMJ*** *: Strategic Management Journal;* ***UD*** *: Unpublished doctoral dissertation;* ***UM*** *: Unpublished manuscript;*

SAMMENVATTING

(SUMMARY IN DUTCH)

STRATEGISCHE ALLIANTIES hebben de afgelopen decennia geleidelijk aan een steeds centralere plaats weten te verwerven als instrument voor ondernemingsgroei. Ondernemingen zoeken in toenemende mate hun toevlucht tot strategische allianties om nieuwe markten te betreden, nieuwe producten te ontwikkelen, en toegang tot relevante kennis en technologische capabiliteiten te verkrijgen. Echter, hoewel allianties groei en waardecreatie kunnen bevorderen, kunnen ze ook waarde vernietigen. Een aantal studies concludeert zelfs dat ongeveer vijftig procent van alle allianties faalt (e.g., Kogut, 1989; Bleeke en Ernst, 1993). De alomtegenwoordigheid van allianties, gecombineerd met de aanzienlijke variatie in hun slagingskansen, heeft ertoe geleid dat zowel academici als mensen in het bedrijfsleven meer inspanningen zijn gaan leveren teneinde een antwoord te vinden op de vraag of ondernemingen baat hebben bij het aangaan van allianties en wat een alliantie tot een succes maakt. Desalniettemin, ondanks de grote hoeveelheid onderzoek die tot op heden is verricht, bieden voorgaande empirische studies geen eenduidige antwoorden op de vragen (a) of de gemiddelde onderneming profijt heeft van het aangaan van allianties, (b) waarom sommige allianties meer waarde toevoegen aan de onderneming dan anderen, en (c) wat de determinanten zijn van de performance van de allianties zelf. In dit proefschrift hebben we met behulp van meta-analyse getracht bovenstaande vragen te beantwoorden aan de hand van robuuste empirische generalisaties inzake de performance van strategische allianties.

De “event study” methodologie is al geruime tijd de meest gebruikelijke methode om de effecten van individuele strategische allianties op de waarde van de onderneming te schatten (Gulati, 1998). In Hoofdstuk 2 onderzoeken we of de grootte van de geschatte reacties van de aandelenmarkt op een gebeurtenis in de onderneming gevoelig is voor de specifieke uitvoering van de event study methodologie. Resultaten van een meta-analyse van 110 studies, welke gezamenlijk de reacties van de aandelenmarkt op de aankondiging van 32.596 strategische allianties onderzoeken, wijzen uit dat geschatte abnormal returns beïnvloed worden door de lengte van de event window. Echter, we vinden ook dat bevindingen van event studies bovenverwacht robuust zijn tegen variaties in de specificatie van het “return-generating” proces, in het controleren voor mogelijke confounding events, in de lengte en het type van de estimation window, en in de compositie en het tijdskader van de steekproef.

Hoofdstuk 3 onderzoekt de link tussen de formatie van allianties en de waarde van de onderneming. Ondanks het grote aantal studies dat tot dusver is uitgevoerd, is het nog verre van duidelijk of en onder welke voorwaarden ondernemingen economische voordelen kunnen onttrekken aan strategische allianties. Hoofdstuk 3 biedt een systematische, kwantitatieve analyse van twee decennia aan empirisch onderzoek om hieruit gedegen inzichten te distilleren omtrent de invloed van de formatie van strategische allianties op de waarde van de onderneming. Onze meta-analyse van 110 studies en in totaal 32.596 strategische allianties, aangegaan tussen 1963 en 2001, leidt tot de krachtige conclusie dat allianties in het algemeen waarde creëren voor de betrokken ondernemingen. Bovendien hebben we een meta-analyse uitgevoerd op 78 studies (83 onafhankelijke steekproeven; N = 15.439) waarin we de effecten van 14 verschillende factoren onderzoeken die de invloed van strategische allianties op de waarde van de onderneming bepalen. De bevindingen van deze analyse laten zien dat het type resources dat

geëxploiteerd wordt in de alliantie, de omstandigheden waaronder de samenwerking tussen de organisaties plaatsvindt, en de ervaring van de samenwerkende ondernemingen cruciale antecedenten zijn van waardecreatie. We bespreken de implicaties van deze empirische resultaten en bieden aanbevelingen voor verder onderzoek.

Hoofdstuk 4 richt zich op een ander niveau van analyse: de determinanten van de performance van allianties zelf. Terwijl onderzoek naar de link tussen alliantie formatie en de waarde van de onderneming (Hoofdstuk 3) zich voornamelijk concentreert op de verschillende typen interdependenties die benut worden in de alliantie en de aanvankelijke omstandigheden waaronder de samenwerking plaatsvindt bij de totstandkoming van de alliantie, benadrukt onderzoek naar de antecedenten van alliantie performance (Hoofdstuk 4) de coöperatieve processen en post-formatie dynamiek die zich tussen de betrokken ondernemingen ontwikkelen als zijnde toonaangevende determinanten van het vermogen van de partners om waarde te creëren middels de samenwerking. In dit hoofdstuk gebruiken we meta-analyse teneinde een geïntegreerd model te testen dat de invloed van aanvankelijke omstandigheden, governance structuur, en post-formatie dynamiek op alliantie performance onderzoekt. Allereerst vinden we dat de variabelen in dit model tezamen een relatief groot aandeel van de variantie in alliantie performance verklaart (tussen 41 en 67 procent). Ten tweede wijzen de resultaten uit dat elk van de factoren afzonderlijk een belangrijk deel van de variantie in alliantie performance verklaart. Aanvankelijke omstandigheden verklaren gemiddeld 16,5 procent, governance structuur 19 procent, en post-formatie dynamiek 18,5 procent van de heterogeniteit in alliantie performance. Dit duidt erop dat alle drie de factoren belangrijke elementen zijn voor het bestuderen en daadwerkelijk managen van allianties. Tenslotte bieden onze resultaten niet alleen inzicht in de invloed van aanvankelijke omstandigheden, governance structuur, en post-formatie dynamiek op

alliantie performance, maar ook in de onderlinge relaties tussen deze factoren. In het bijzonder vinden we dat aanvankelijke omstandigheden zoals de mate van complementariteit en de cultural distance tussen de samenwerkende ondernemingen de governance structuur van de alliantie beïnvloeden en dat zowel de aanvankelijke omstandigheden als de governance structuur, op hun beurt, de post-formatie dynamiek vormgeven die zich tussen de alliantie partners afspeelt. Het laatste hoofdstuk van dit proefschrift, Hoofdstuk 5, geeft een samenvatting van de belangrijkste bevindingen en speculeert over potentiële richtingen voor verder onderzoek.